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Vol. 947 Number 1

OFFICIAL GAZETTE

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UNITED STATES PATENT AND TRADEMARK OFFICE

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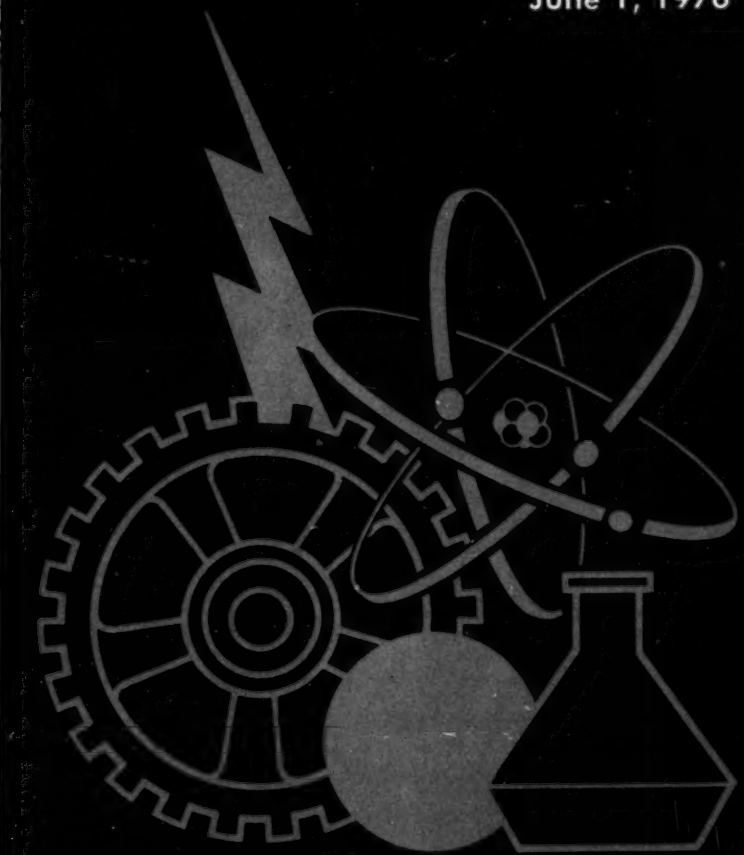
June 1, 1976



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OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

June 1, 1976 Volume 947 Number 1

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PATENT AND TRADEMARK OFFICE NOTICES

Trademark Manual of Examining Procedure (Revised Pages)

The first set of revised pages for insertion in the Trademark Manual of Examining Procedure (TMEP) is now being distributed to subscribers of the Manual by the Superintendent of Documents, United States Government Printing Office. These pages are identified as "Rev. 1, Jan. 1976."

This announcement is being made as a service to subscribers so that they will be aware that a revision of the Manual has been published. Inquiries concerning subscriptions, or the delivery of revision material, should be sent to the Superintendent of Documents, United States Government Printing Office, Customer Service Section SSOS, Washington, D.C. 20402.

The availability of the Trademark Manual of Examining Procedure, with instructions for ordering, was announced in the OFFICIAL GAZETTE of June 25, 1974 (923 O.G. TM 204). It continues to be available as described in that notice.

BERNARD A. MEANY,
Assistant Commissioner for Trademarks.

Apr. 26, 1976.

Board of Appeals Decisions Rendered in the Month of April 1976

Examiner affirmed	250
Examiner affirmed in part	39
Examiner reversed	94
Total	383

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

3,030,965, F. Labbe, TOBACCO MANIPULATING MACHINES; **3,030,966,** R. Lanore, FILLER FORMING MECHANISM; **3,032,041,** same, TOBACCO-MANIPULATING MACHINES; **3,088,467,** F. A. M. Labbe, TOBACCO MANIPULATING MACHINERY; **3,088,468,** same; **3,192,931,** R. Lanore, TOBACCO-MANIPULATING MACHINES; **3,306,305,** D. W. Molins, MANUFACTURE OF CIGARETTES, **filed** July 29, 1975, D.C., S.D.N.Y., Doc. 75–C–3697, *Hauni Werke Koerber & Co., K.G.* v. *Molins Ltd.*

3,030,966. (See 3,030,965.)

3,032,041. (See 3, 030,965.)

3,088,467. (See 3,030,965.)

3,088,468. (See 3,030,965.)

3,135,019, E. O. Aichele, MACHINE FOR APPLYING SEALING LINERS OF THERMOPLASTIC MATERIAL TO BOTTLE CAPS OR THE LIKE; **3,360,827,** same, PLASTIC DISPENSING MEANS, **filed** Nov. 12, 1969, D.C. Del. (Wilmington) Doc. 3804, *Zapata Industries, Inc. and Marie K. Aichele* v. *United States Crown Corporation.* Order, defendant permanently enjoined from infringing upon claims 1, 2 and 3 of Patent 3,135,019 and/or claims 1 and 3 of Patent 3,360,827. Counterclaims are dismissed for lack of prosecution, Oct. 21, 1974.

3,192,624, D. Gringer, KNIFE HANDLE WITH ADJUSTABLE BLADE, **filed** Aug. 22, 1975, D.C., N.D. Ill. (Chicago) Doc. 75c2830, *Allway Tools, Inc.* v. *Industries Egana, S.A. and Great Neck Saw Manufacturers, Inc.* Consent judgment, patent is valid and defendant is enjoined from infringing upon said patent. Said second cause of action solely as against Great Neck is dismissed without prejudice, Dec. 3, 1975.

3,192,931. (See 3,030,965.)

3,197,710, H. C. Lin, COMPLEMENTARY TRANSISTOR STRUCTURE; **3,237,062,** B. T. Murphy, MONOLITHIC SEMICONDUCTOR DEVICES; **3,321,340,** B. T. Murphy, METHODS FOR FORMING MONOLITHIC SEMICONDUCTOR DEVICES; **3,412,460,** H. C. Lin, METHOD OF MAKING COMPLEMENTARY TRANSISTOR STRUCTURE, **filed** July 8, 1975, D.C., N.D. Ill. (Chicago) Doc. 75c2230, *Westinghouse Electric Corporation* v. *Motorola, Inc. et al.* Case closed pursuant to Rule 41(a)(1) of the Federal Rules of Civil Procedure, Dec. 18, 1975.

3,197,731, H. C. Lin, COMPLEMENTARY TRANSISTOR STRUCTURE; **Re. 25,595,** Schwab, Beale and Anderson, PRINTED CIRCUIT BOARD FILE, **filed** Jan. 6, 1976, D.C., C.D. Calif. (Los Angeles) Doc. CV–76–0044, *Scanbe Manufacturing Corp.* v. *Jack Berman Company, Inc.*

3,237,062. (See 3,197,710.)

3,306,305. (See 3,030,965.)

3,321,340. (See 3,197,710.)

3,360,837. (See 3,135,019.)

3,388,069, W. J. King, METHOD OF FORMING A P-N JUNCTION BY AN IONIC BEAM; **3,395,292,** H. Z. Bogert, SHIFT REGISTER USING INSULATED GATE FIELD EFFECT TRANSISTORS; **3,406,346,** F. M. Wanlass, SHIFT REGISTER SYSTEM; **3,472,751,** W. J. King, METHOD AND APPARATUS FOR FORMING DEPOSITS ON A SUBSTRATE BY CATHODE SPUTTERING USING A FOCUSSED ION BEAM; **3,509,180,** RANDOM ACCESS READ-WRITE MEMORY SYSTEM HAVING DATA REFRESHING CAPABILITIES AND MEMORY CELL THEREFOR; **3,611,437,** Varadi and Rubinstein, READ-ONLY MEMORY WITH OPERATIVE AND INOPERATIVE DATA DEVICES LOCATED AT ADDRESS STATIONS AND WITH MEANS FOR CONTROLLABLY CHARGING AND DISCHARGING APPROPRIATE MODES OF THE ADDRESS STATIONS; **3,683,203,** K. F. Smith, ELECTRONIC SHIFT REGISTER SYSTEM; **3,765,003,** Paivinen, Rubinstein, Cohen and Baker, READ-WRITE RANDOM ACCESS MEMORY SYSTEM HAVING SINGLE DEVICE MEMORY CELLS WITH DATA REFRESH, **filed** Oct. 29, 1975, D.C. Del. (Wilmington) Doc. 75–336, *General Instrument Corporation* v. *Mostek Corporation.*

3,389,365, Matthews and Rhine, VARIABL RESISTOR WITH SWITCH; **Re. 26,781,** C. Frenzel, TRIGGER ACTUATED SWITCH DEVICE, **filed** June 24, 1970, D.C., N.D. Ill. (Chicago) Doc. 70c1523, *Skil Corporation* v. *Rockwell Mfg. Co.* Enter order on stipulation dismissing action, Apr. 4, 1975.

3,392,292. (See 3,388,009.)

3,406,346. (See 3,388,009.)

3,412,460. (See 3,197,710.)

3,472,751. (See 3,388,009.)

3,475,234, Kerwin, Klein and Sarace, METHOD FOR MAKING MIS STRUCTURES; **3,544,399,** H. G. Dill, INSULATED GATE FIELD-EFFECT TRANSISTOR (IGFET) WITH SEMICONDUCTOR GATE ELECTRODE; **3,576,478,** Watkins and Selser, IGFET COMPRISING N-TYPE SILICON SUBSTRATE, SILICON OXIDE GATE INSULATOR AND P-TYPE POLYCRYSTALLINE SILICON GATE ELECTRODE, **filed** Nov. 11, 1974, D.C. Del. (Wilmington) Doc. 74–238, *Bell Telephone Laboratories, Inc.* v. *Hughes Aircraft Company and General Instrument Corporation.*

3,519,163, R. V. Bardell, CONTAINER AND CLOSURE THEREFOR; **3,770,156,** G. Yates, Jr., TAMPER PROOF CLOSURE, **filed** July 17, 1975, D.C., N.D. Ill. (Chicago) Doc. 75c2377, *Park Ohio Industries* v. *Vulcan Containers.* **Same, filed** July 18, 1975, D.C., C.D. Calif. (Los Angeles) Doc. 75–2462–DWW, *Park Ohio Industries, Inc. and Growth International Industries Corp.* v. *B. W. Norton Mfg. Co., Inc.*

3,544,399. (See 3,475,234.)

3,544,399, H. G. Dill, INSULATED GATE FIELD-EFFECT TRANSISTOR (IGFET) WITH SEMICONDUCTOR GATE ELECTRODE, **filed** May 12, 1972, D.C. Del. (Wilmington) Doc. 4379, *Hughes Aircraft Company* v. *General Instrument Corporation.* Final judgment, defendant acquired from plaintiff a license to practice the invention of the patent. All outstanding issues having been resolved, this action is hereby terminated, Apr. 29, 1975.

3,576,478. (See 3,475,234.)

3,509,180. (See 3,388,009.)

3,611,437. (See 3,388,009.)

3,683,203. (See 3,388,009.)

3,765,003. (See 3,388,009.)

3,770,156. (See 3,519,163.)

3,770,156, G. Yates, Jr., TAMPER PROOF CLOSURE, **filed** July 17, 1975, D.C., N.D. Ohio (Cleveland) Doc. C75–616, *Park Ohio Industries, Inc. and Growth International Industries Corp.* v. *Davies Can Co. and Van Dorn Co.* **Same, filed** July 17, 1975, D.C., N.D. Ohio (Cleveland) Doc. C75–617, *Park Ohio Industries, Inc. and Growth International Industries Corp.* v. *Cleveland Steel Container Corp.* **Same, filed** July 17, 1975, D.C., N.D. Ill. (Chicago) Doc. 75c2378, *Park Ohio Industries* v. *Growth International Industries.* **Same, filed** July 17, 1975, D.C., N.D. Tex (Dallas), Doc. CA3–75–0873–C, *Park Ohio Industries, Inc. and Growth International Industries, Inc.* v. *Plastic Industrial Containers, Inc.* **Same, filed** Aug. 7, 1975, D.C., E.D. Mich. (Detroit) Doc. 75–71490, *Park Ohio Industries, Inc. and Growth International Industries Corp.* v. *Letica Corporation.* **Same, filed** Aug. 13, 1975, D.C., E.D. Mich. (Detroit) Doc. 75–71534, *Letica Corporation* v. *Park-Ohio Industries, Inc.*

Re. 25,595. (See 3,197,131.)

Re. 26,781. (See 3,389,365.)

PATENT NOTICES

Certificates of Correction for the Week of June 1, 1976

Re. 27,740	3,895,058	3,922,934	3,935,947
Re. 28,485	3,895,716	3,923,486	3,935,984
Re. 28,553	3,896,303	3,923,501	3,936,245
Re. 28,699	3,898,217	3,923,702	3,936,460
D. 235,341	3,899,386	3,924,041	3,936,639
D. 237,901	3,899,916	3,924,643	3,936,849
D. 238,914	3,901,923	3,925,157	3,937,200
D. 239,165	3,903,048	3,925,446	3,937,692
3,566,160	3,904,997	3,927,089	3,937,877
3,671,224	3,905,908	3,927,157	3,938,036
3,727,188	3,906,007	3,927,186	3,938,659
3,772,184	3,906,970	3,927,858	3,938,771
3,772,350	3,910,077	3,928,101	3,938,882
3,780,668	3,910,531	3,928,120	3,939,131
3,781,306	3,910,784	3,928,863	3,939,146
3,792,034	3,911,070	3,929,049	3,939,768
3,793,747	3,911,159	3,929,213	3,939,922
3,803,176	3,911,202	3,929,528	3,940,211
3,803,272	3,912,726	3,929,637	3,940,256
3,806,757	3,912,783	3,929,751	3,940,413
3,807,904	3,913,617	3,929,791	3,940,469
3,813,025	3,914,577	3,930,401	3,940,853
3,813,936	3,915,267	3,930,498	3,940,871
3,815,737	3,915,802	3,930,532	3,941,300
3,834,438	3,915,803	3,930,974	3,941,400
3,843,167	3,917,173	3,931,168	3,941,576
3,849,092	3,917,442	3,931,247	3,941,638
3,853,164	3,917,550	3,931,325	3,941,641
3,855,144	3,917,599	3,931,407	3,941,872
3,856,772	3,917,875	3,931,476	3,942,455
3,857,927	3,918,968	3,931,783	3,942,819
3,858,002	3,918,975	3,932,092	3,942,936
3,862,069	3,919,026	3,932,871	3,943,241
3,869,360	3,919,292	3,933,328	3,943,313
3,871,408	3,920,284	3,933,759	3,944,083
3,871,833	3,920,398	3,933,780	3,944,200
3,874,402	3,920,634	3,934,444	3,944,485
3,874,618	3,920,689	3,934,618	3,945,668
3,877,238	3,920,719	3,935,154	3,946,051
3,878,962	3,920,911	3,935,175	3,946,130
3,880,812	3,921,539	3,935,219	3,946,315
3,880,972	3,921,798	3,935,263	3,946,521
3,881,011	3,922,267	3,935,265	3,947,157
3,885,297	3,922,274	3,935,470	
3,886,121	3,922,640	3,935,878	

Dedication

3,910,821.—*Robert Paul Corn*, La Grange, Ill. ENZYMATIC ISOMERIZATION PRODUCT. Patent dated Oct. 7, 1975. Dedication filed Apr. 29, 1976, by the assignee, *CPC International Inc.*

Hereby dedicates to the Public the entire term of said patent.

Disclaimers

2,867,230.—*Ralph E. Bletcher* and *Irving A. Ward*, Los Angeles, Calif. DIVERTER VALVE FOR A SHOWER INSTALLATION. Patent dated Jan. 6, 1959. Disclaimer filed Feb. 23, 1976, by the assignee, *Pearl White Bletcher*, part interest.

Hereby enters this disclaimer to her entire interest in all claims of said patent.

2,875,702.—*Ralph E. Bletcher* and *Irving A. Ward*, Los Angeles, Calif. COMBINATION FIXTURE. Patent dated Mar. 3, 1959. Disclaimer filed Feb. 23, 1976, by the assignee, *Pearl White Bletcher*, part interest.

Hereby enters this disclaimer to her entire interest in all claims of said patent.

2,894,695.—*Ralph Edwin Bletcher* and *Irving A. Ward*, Los Angeles, Calif. SPOUT FITTING. Patent dated July 14, 1959. Disclaimer filed Feb. 23, 1976, by the assignee, *Pearl White Bletcher*, part interest.

Hereby enters this disclaimer to her entire interest in all claims of said patent.

2,923,315.—*Ralph E. Bletcher, Irving A. Ward*, and *Ernest H. Bucknell*, Los Angeles, Calif. REMOVABLE VALVE. Patent dated Feb. 2, 1960. Disclaimer filed Feb. 23, 1976, by the assignee, *Pearl White Bletcher*, part interest.

Hereby enters this disclaimer to her entire interest in all claims of said patent.

2,969,951.—*George W. Walton*, Dallas, Tex. PUMP VALVE. Patent dated Jan. 31, 1961. Disclaimer filed Mar. 22, 1976, by the assignee, *Dresser Industries, Inc.*

Hereby enters this disclaimer to claims 1–4 of said patent.

3,173,444.—*Ernest H. Bucknell* and *Irving A. Ward*, Los Angeles, Calif. REMOVABLE CARTRIDGE TYPE MIXING VALVE. Patent dated Mar. 16, 1965. Disclaimer filed Feb. 23, 1976, by the assignee, *Pearl White Bletcher*, part interest.

Hereby enters this disclaimer to her entire interest in all claims of said patent.

3,176,716.—*Ernest H. Bucknell* and *Irving A. Ward*, Los Angeles, Calif. DETERGENT DISPENSER. Patent dated Apr. 6, 1965. Disclaimer filed Feb. 23, 1976, by the assignee, *Pearl White Bletcher*, part interest.

Hereby enters this disclaimer to her entire interest in all claims of said patent.

3,336,935.—*Irving A. Ward* and *James H. Bletcher*, Los Angeles, Calif. DIVERTER. Patent dated Aug. 22, 1967. Disclaimer filed Feb. 23, 1976, by the assignee, *Pearl White Bletcher*, part interest.

Hereby enters this disclaimer to her entire interest in all claims of said patent.

3,342,250.—*Helmut Treppschuh* and *Robert L. Hentrich*, Geisweid, Germany. METHOD OF AND APPARATUS FOR VACUUM MELTING AND TEEMING STEEL AND STEEL-LIKE ALLOYS. Patent dated Sept. 19, 1967. Disclaimer filed Mar. 31, 1976, by the assignee, *Stahlwerke Südwestfalen Aktiengesellschaft.*

Hereby enters this disclaimer to claim 8 of said patent.

3,376,884.—*Ernest H. Bucknell* and *Irving A. Ward*, Los Angeles, Calif. ANTI-SIPHON DIVERTER UNIT. Patent dated Apr. 9, 1968. Disclaimer filed Feb. 23, 1976, by the assignee, *Pearl White Bletcher*, part interest.

Hereby enters this disclaimer to her entire interest in all claims of said patent.

3,392,165.—*John A. Edwards*, Los Altos, Calif., and *Lawrence H. Knox*, deceased, late of Mexico City, Mexico, by *Anne A. Knox*, Mexico City, Mexico. ESTRA-1,3,5(10)-TRIENES SUBSTITUTED AT THE 17α-POSITION WITH A PROPADIENYL OR SUBSTITUTED PROPADIENYL RADICAL. Patent dated July 9, 1968. Disclaimer filed Apr. 9, 1976, by the assignee, *Syntex Corporation.*

Hereby enters this disclaimer to claims 6 and 18 of said patent.

3,392,166.—*John A. Edwards*, Los Altos, Calif., and *Lawrence H. Knox*, deceased, late of Mexico City, Mexico, by *Anne A. Knox*, Mexico City, Mexico. ANDROST-4-ENES AND ESTR-4-ENES HAVING A 17α-DIETHYLENICALLY UNSATURATED SIDE CHAIN. Patent dated July 9, 1968. Disclaimer filed Apr. 9, 1976, by the assignee, *Syntex Corporation*.

Hereby enters this disclaimer to claims 10, 12, 14, 15 and 19 of said patent.

3,415,279.—*Ernest H. Bucknell* and *Irving A. Ward*, Los Angeles, Calif. COAXIAL CONTROL VALVE. Patent dated Dec. 10, 1968. Disclaimer filed Feb. 23, 1976, by the assignee, *Pearl White Bletcher*, part interest.

Hereby enters this disclaimer to her entire interest in all claims of said patent.

3,415,454.—*Ernest H. Bucknell*, Los Angeles, and *Jack K. Rauh* and *Irving A. Ward*, Hacienda Heights, Calif. SPRAY VALVE. Patent dated Dec. 10, 1968. Disclaimer filed Feb. 23, 1976, by the assignee, *Pearl White Bletcher*, part interest.

Hereby enters this disclaimer to her entire interest in all claims of said patent.

3,461,901.—*Ernest H. Bucknell* and *Irving A. Ward*, Los Angeles, Calif. DIVERTING SPOUT. Patent dated Aug. 19, 1969. Disclaimer filed Feb. 23, 1976, by the assignee, *Pearl White Bletcher*, part interest.

Hereby enters this disclaimer to her entire interest in all claims of said patent.

3,683,770.—*Edwin H. Land* and *Alfred H. Bellows*, Cambridge, Mass. FOLDING CAMERA. Patent dated Aug. 15, 1972. disclaimer filed Apr. 5, 1976, by the assignee, *Polaroid Corporation*.

Hereby enters this disclaimer to claims 1–4, 8, 11–18, 27, 30, 31 and 33 of said patent.

3,684,190.—*James H. Bletcher*, Pacific Palisades, and *Jack K. Rauh*, Hacienda Heights, Calif. QUICK DISCONNECT. Patent dated Aug. 15, 1972. Disclaimer filed Feb. 23, 1976, by the assignee, *Pearl White Bletcher*, part interest.

Hereby enters this disclaimer to her entire interest in all claims of said patent.

3,722,798.—*James H. Bletcher*, Pacific Palisades, and *Jack K. Rauh*, Hacienda Heights, Calif. COMBINED AERATOR-SPRAY ASSEMBLY. Patent dated Mar. 27, 1973. Disclaimer filed Feb. 23, 1976, by the assignee, *Pearl White Bletcher*, part interest.

Hereby enters this disclaimer to her entire interest in all claims of said patent.

3,739,806.—*Ernest H. Bucknell*, Los Angeles, *Jack K. Rauh*, Hacienda Heights, and *Tony Radecki*, Los Angeles, Calif. DIAPHRAGM SPOUT ASSEMBLY. Patent dated June 19, 1973. Disclaimer filed Feb. 23, 1976, by the assignee, *Pearl White Bletcher*, part interest.

Hereby enters this disclaimer to her entire interest in all claims of said patent.

3,787,068.—*Lester Miller*, Topeka, Ind. ARTICULATED TRAILER HITCH. Patent dated Jan. 22, 1974. Disclaimer filed Nov. 28, 1975, by the assignee, *Bangor Punta Operations, Inc.*

Hereby enters this disclaimer to the remaining term of said patent.

3,811,780.—*Max D. Liston*, Irvine, Calif. CHEMICAL ANALYSIS CUVETTE. Patent dated May 21, 1974. Disclaimer filed Apr. 12, 1976, by the assignee, *Abbott Laboratories*.

Hereby enters this disclaimer to claims 1, 3, 4, 5, 9 and 10 of said patent.

3,839,511.—*Shigeo Kishino*, Tokyo, and *Akio Kudamatsu* and *Kozo Shiokawa*, Kanagawa, Japan. O-ETHYL-S-n-PROPYL-O-(SUBSTITUTED PHENYL)-PHOSPHOROTHIOLATES. Patent dated Oct. 1, 1974. Disclaimer filed Apr. 22, 1976, by the assignee, *Bayer Aktiengesellschaft*.

Hereby enters this disclaimer to claims 2, 3 and 4 of said patent.

3,840,147.—*Wilbert O. O'Neal* and *Burford J. Page*, Independence, Mo., and *Charles E. Simek*, Overland Park, Kans. SHELF APPARATUS FOR HELIX TYPE PRODUCT DISPENSING MACHINES. Patent dated Oct. 8, 1974. Disclaimer filed Apr. 12, 1976, by the assignee, *The Vendo Company*.

Hereby enters this disclaimer to claim 1 of said patent.

3,874,719.—*Wynand M. J. M. Goyarts*, Battle Creek, Mich. EXTENSIBLE LOAD LIFTING FRAME. Patent dated Apr. 1, 1975. Disclaimer filed Apr. 2, 1976, by the assignee, *Clark Equipment Company*.

Hereby enters this disclaimer to claim 15 of said patent.

3,888,820.—*Irving Touval*, Fords, and *Morris Dunkel*, Paramus, N.J. NOVEL FLAME RETARDANT COMPOSITIONS OF MATTER. Patent dated June 10, 1975. Disclaimer filed July 18, 1975, by the assignee, *Universal Oil Products Company*.

Hereby enters this disclaimer to claim 7 of said patent.

3,903,533.—*Walter G. Lehmann*, Somerville, Mass. PHOTOGRAPHIC CAMERA AND FLASH LAMP SELECTION SYSTEM. Patent dated Sept. 2, 1975. Disclaimer filed Apr. 5, 1976, by the assignee, *Polaroid Corporation*.

Hereby enters this disclaimer to claims 1, 2, 3, 4, 12, 13, 17, 18, 19, 20, 28 and 29 of said patent.

3,904,685.—*Iraj Khatib Shahidi*, Florham Park, N.J., and *Jorge Alberto Blay*, Corpus Christi, Tex. POLYACRYLIC ACID HAVING HIGH CHELATION VALUE AND ITS PRODUCTION. Patent dated Sept. 9, 1975. Disclaimer filed Apr. 14, 1976, by the assignee, *Celanese Corporation*.

Hereby enters this disclaimer to the remaining term of said patent.

National Technical Information Service

GOVERNMENT-OWNED INVENTIONS

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Copies of the patent applications, either paper copy (PC) or microfiche (MF), can be purchased at the prices cited from the National Technical Information Service (NTIS), Springfield, Va. 22161. Requests for copies of patent applications must include the patent application number. Claims are deleted from patent application copies sold to the public to avoid premature disclosure in the event of an interference before the Patent and Trademark Office. Claims and other technical data will usually be made available to serious prospective licensees by the agency which filed the case.

Requests for licensing information on a particular invention should be directed to the address cited for the agency-sponsor.

DOUGLAS J. CAMPION,
Patent Program Coordinator.

U.S. DEPARTMENT OF THE AIR FORCE
AF/JACP, Washington, D.C. 20314

Patent application 621,330. Fixed Skewed Wing Airborne Vehicle. Filed Oct. 10, 1975. PC $3.50/MF $2.25.

Patent application 629,467. Antinarcissus Reflector Assembly for Infrared Detector. Filed Nov. 6, 1975. PC $3.50/MF $2.25.

Patent application 631,280. Fuel Grain for Spherical Boost-Sustain Rocket Motor. Filed Nov. 12, 1975. PC $3.50/MF $2.25.

Patent 3,919,884. Horizontal Loading Fixture for Sustained Load Testing. Filed Apr. 17, 1974. Patented Nov. 18, 1975. Not available NTIS.

Patent 3,920,206. Non-Penetrating RIB-to-Surface Structural Clip Connector Assembly. Filed Aug. 5, 1974. Patented Nov. 18, 1975. Not available NTIS.

Patent 3,920,336. System for Intensification of Weak Absorption and Collection of Weak Light Emission. Filed May 21, 1974. Patented Nov. 18, 1975. Not available NTIS.

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TENNESSEE VALLEY AUTHORITY
Division of Law, Muscle Shoals, Ala. 35660

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NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Assistant General Counsel for Patent Matters—NASA
Code GP–2, Washington, D.C. 20546

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Patent application 629,456. Reel Safety Brake. Filed Nov. 6, 1975. PC $3.50/MF $2.25.

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Patent application 637,268. Wind Measurement System. Filed Dec. 3, 1975. PC $3.50/MF $2.25.

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Patent application 641,801. Forward-Scatter Polarimeter for Determining the Gaseous Depolarization Factor in the Presence of Polluting Polydispersed Particles. Filed Dec. 18, 1975. PC $3.50/MF $2.25.

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U.S. DEPARTMENT OF THE AIR FORCE
AF/JACP, Washington, D.C. 20314

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U.S. DEPARTMENT OF AGRICULTURE
Research Agreements and Patent Mgmt. Branch, General Services Division, Federal Bldg., Agricultural Research Service, Hyattsville, Md. 20782

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Patent 3,631,725. Automatic Transfer Flask. Filed Nov. 25, 1969. Patented Jan. 4, 1972. Not available NTIS.

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U.S. DEPARTMENT OF COMMERCE
Assistant General Counsel for Administration
Washington, D.C. 20230

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U.S. DEPARTMENT OF TRANSPORTATION
Patent Counsel, 400 7th St. SW.
Washington, D.C. 20590

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U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
National Institutes of Health, Chief, Patent Branch
Westwood Bldg., Bethesda, Md. 20014

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U.S. DEPARTMENT OF THE NAVY
Assistant Chief for Patents, Office of Naval Research
Code 302, Arlington, Va. 22217

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Patent 3,811,422. Chemical Heater Tube. Filed Oct. 5, 1972. Patented May 21, 1974. Not available NTIS.

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Patent 3,840,844. Electron-Beam Analog Computer for Determining Coordinates of a Seafloor Point. Filed Sept. 24, 1973. Patented Oct. 8, 1974. Not available NTIS.

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Patent 3,845,937. Helicopter Cargo Lifting System. Filed Dec. 14, 1973. Patented Nov. 5, 1974. Not available NTIS.

Patent 3,846,493. Nitro Substituted Acrylic Acid Amides. Filed Jan. 28, 1971. Patented Nov. 5, 1974. Not available NTIS.

Patent 3,846,770. Serial Access Memory Using Magnetic Domains in Thin Film Strips. Filed July 11, 1973. Patented Nov. 5, 1974. Not available NTIS.

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Patent 3,909,773. Underwater Teletype Communication System. Filed June 19, 1974. Patented Sept. 30, 1975. Not available NTIS.

TENNESSEE VALLEY AUTHORITY
Division of Law, Muscle Shoals, Ala. 35660

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NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Assistant General Counsel for Patent Matters—NASA
Code GP–2, Washington, D.C. 20546

Patent application 641,802. An Improved Accumulator. Filed Dec. 18, 1975. PC $3.50/MF $2.25.

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Patent 3,914,997. Static Pressure Probe. Patented Oct. 28, 1975. Not available NTIS.

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Patent 3,920,339. Strain Arrestor Plate for Fused Silica Tile. Patented Nov. 18, 1975. Not available NTIS.

Patent 3,920,413. Panel for Selectively Absorbing Solar Thermal Energy and the Method of Producing Said Panel. Patented Nov. 18, 1975. Not available NTIS.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF MAY 8, 1976

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds: Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	7-2-75
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur: Misc. Esters; Carbohydrates; Herbicides: Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	7-31-75
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	2-7-75
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products: Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures: Special Utility Compositions: Bleaching; Dyeing and Photography.	6-2-75
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods: Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	7-21-75
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization: General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures: Illumination: Horology; Acoustics; Recorders; Weighing Scales.	4-1-75
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition: Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	6-23-75
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	5-22-75
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	11-7-75
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics: Radiant Energy; Measuring.	6-16-75
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	1-10-75
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service: Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	6-5-75
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools: Cutlery; Jacks.	10-6-75
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco: Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	6-16-75
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director. Power Plants: Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	5-15-75
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	10-2-75

Expiration of patents: The patents within the range of numbers indicated below expire during May 1976, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,884,634 to 2,588,678 inclusive
Plant Patents..... Numbers 1,829 to 1,837 inclusive

DEFENSIVE PUBLICATIONS

PUBLISHED JUNE 1, 1976

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O.G. 687. The abstracts of Defensive Publication applications are identified by distinctly numbered series and are arranged chronologically. The heading of each abstract indicates the number of pages of specification, including claims and sheets of drawings contained in the application as originally filed. The files of these applications are available to the public for inspection and reproduction may be purchased for 30 cents a sheet.

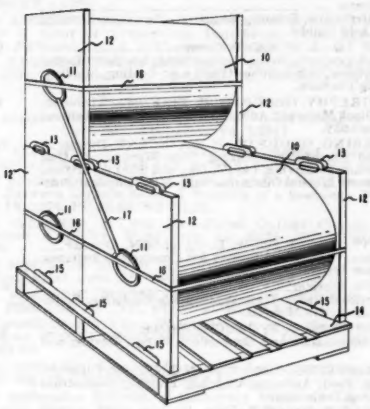
Defensive Publication applications have not been examined as to the merits of alleged invention. The Patent and Trademark Office makes no assertion as to the novelty of the disclosed subject matter.

T947,001
TIERED PACKAGE ASSEMBLY

Anthony Louis Mavredes, Wilmington, Del., assignor to E. I. du Pont de Nemours & Company, Wilmington, Del.

Continuation of abandoned application Ser. No. 391,470, Aug. 24, 1973. This application May 2, 1975, Ser. No. 573,992

Int. Cl. B65d *21/00*
U.S. Cl. 206—504
2 Sheets Drawing. 6 Pages Specification



A tiered assembly of like packages horizontally supported between vertically positioned, flat end suspension panels is interlocked by means of clips engaging the panels of adjacent packages. Each clip has a planar central section with parallel lateral sides with at least one lip projecting upwardly from each side and at least one flap projecting downwardly from each side. The central section has at least one sharp projection extending from at least one of its surfaces adapted to engage the outermost edge surfaces of the end suspension panels upon which they bear.

T947,002
POLYVINYL CHLORIDE COMPOSITIONS

Don Rhea, Rte. 15, 421 Old Castle Road, Kingsport, Tenn. 37660

Continuation of abandoned application Ser. No. 446,872, Feb. 28, 1974. This application May 16, 1975, Ser. No. 578,234

Int. Cl. C08k *5/12*
U.S. Cl. 260—31.8 R
No Drawing. 9 Pages Specification

Iron oxide (Fe_2O_3) and potassium fluoride, when mixed together in approximately equal amounts and incorporated into plasticized polyvinyl chloride in small quantities, have a synergistic effect in reducing smoke from the polymer during burning.

T947,003
OVERBASED NONIONIC PLUS HIGH MOLECULAR WEIGHT SULFONATE WATERFLOOD ADDITIVE AND PROCESS OF USING SAME

Charles R. Clark and Oliver C. Kerfoot, Ponca City, Okla., and Delmar D. Krehbiel, Lubbock, Tex., assignors to Continental Oil Company, Ponca City, Okla.

Continuation of abandoned application Ser. No. 342,018, Mar. 16, 1973. This application May 14, 1975, Ser. No. 577,249

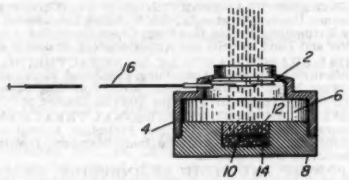
Int. Cl. E21b *43/20, 43/22*
U.S. Cl. 252—8.55 D
No Drawing. 23 Pages Specification

An overbased waterflood additive comprising a water-soluble nonionic surfactant (such as an ethoxylated alkanol) plus a water-insoluble high molecular weight hydrocarbon sulfonate having an equivalent weight of about 400 to about 600 plus an overbasing amount of a base component such as an alkali metal hydroxide, ammonium hydroxide, or an alkali metal carbonate is prepared and is injected into a petroliferous formation to improve a waterflood process. Sufficient overbasing base component is employed such that the ratio: "weight of excess base component/weight of sulfonate" is about 0.03 to about 5.0.

T947,004
APPARATUS FOR SEMI-QUANTITATIVE MEASUREMENT OF CHEMICAL RESPONSE TO U.V. RADIATION

George L. Collins, 44 The Fellsway, Murray Hill, N.J. 07974, and William V. Garruto, 331 W. Scott Ave., Rahway, N.J. 07065

Filed Jan. 30, 1975, Ser. No. 545,271
Int. Cl. G01n *21/06, 33/44*
U.S. Cl. 23—230 R
1 Sheet Drawing. 7 Pages Specification



A device for semi-quantitative measurement of chemical response of photoinitiators and resin systems to U.V. radiation which comprises a shutter positioned on a housing having a cavity within. The housing is separable into an upper and lower portion giving access to the cavity. A U.V. curable resin is placed within the aluminum housing and the entire assembly is passed under a U.V. lamp where the shutter is activated. The rate and/or extent of reaction can be determined by analysis of the exposed sample

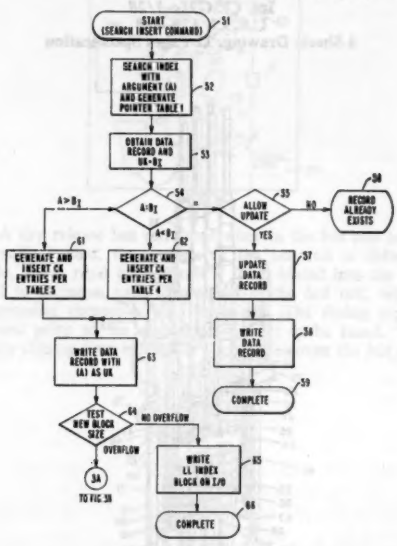
T947,005

MULTI-LEVEL COMPRESSED INDEX INSERTION AND DELETION METHOD AND MEANS

Edward Loizides, Poughkeepsie, and George F. Steigerwalt, Jr., Hyde Park, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of application Ser. No. 417,459, Nov. 19, 1973, which is a continuation of application Ser. No. 99,863, Dec. 21, 1970. This application Apr. 24, 1975, Ser. No. 573,494

Int. Cl. G06f *7/00*
U.S. Cl. 444—1
34 Sheets Drawing. 111 Pages Specification



To enable the maintenance on a real-time basis of a multi-level compressed index generated by the method and means disclosed in U.S. Pat. 3,603,937 issued Sept. 7, 1971. Such index can be searched by the method and means disclosed in US. Pat. 3,643,226 issued Feb. 15, 1972. Two types of operation on an existing multi-level compressed index structure are disclosed; they are (1) insertion of new compressed key entries, and (2) deletion of existing compressed key entries Both operations (1) and (2) begin at the lowest index level and proceed upward through the multi-level compressed index hierarchy until the operations are complete.

T947,006

MODIFIED CRACKING OF PARAFFINS

David V. Porchey, Dennis Jack Royer, and Charles M. Starks, Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Continuation of abandoned application Ser. No. 489,958, July 19, 1974. This application July 28, 1975, Ser. No. 599,564

Int. Cl. C07c *3/30*
U.S. Cl. 260—683 R
No Drawing. 12 Pages Specification

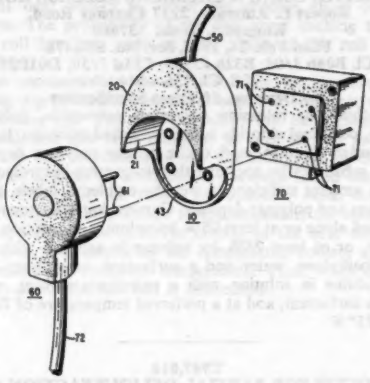
In a process for cracking normal paraffins containing from about 2 to about 10 carbon atoms to alkenes, the instant invention relates to an improvement comprising admixing about 0.1 to about 70 percent by weight of H_2Se or H_2Te (or an amount of a compound which yields a SeH or a TeH radical in the cracking environment sufficient to yield that amount of SeH or TeH) based on the hydrocarbon stream containing the paraffins and the paraffin to be cracked and then passing the resulting mixture through a reactor maintained at a temperature of about 900° F. to about 2000° F. with a residence time of about 0.01 to about 20 seconds and a pressure of about 0 to about 5000 p.s.i.g. Steam is also employed.

T947,007

CONNECTOR BLOCK FOR BRIDGING BETWEEN A TELEPHONE WALL JACK AND PLUG

Charles Louis Krumreich and Robert Allen Spencer, Indianapolis, Ind., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 23, 1975, Ser. No. 543,258
Int. Cl. H01r *31/00*
U.S. Cl. 339—154 A
3 Sheets Drawing. 7 Pages Specification



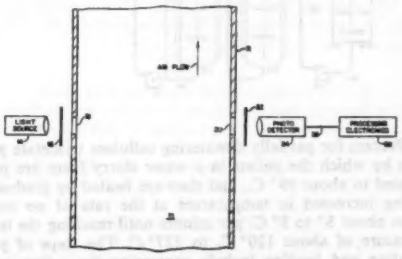
Connection of an auxiliary device to a telephone line at a customer's premises is easily and reliably made even by inexperienced personnel through a new adapter. The adapter consists basically of from two to four thin spring conductors mounted within a thin shelf and provided with oblong holes which accommodate around the prongs of a standard telephone plug. The plug then fits into a standard telephone wall jack, with more than sufficient penetration to assure adequate telephone connection.

T947,008

SODIUM OXIDE SMOKE DETECTION

Rolv Hundal, Greensburg, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 31, 1975, Ser. No. 546,151
Int. Cl. G01n *21/12, 21/40*
U.S. Cl. 356—114
1 Sheet Drawing. 8 Pages Specification



A method and apparatus for identifying the presence of sodium oxide smoke within a gas enclosure. In accordance therewith a source of light is polarized in a single plane and transmitted through the enclosure to a

photodetector screened to receive only incident light having substantially the same angle of polarization as the light initially transmitted through the enclosure. Attenuation in the incident light below a given threshold is identified as being indicative of the presence of sodium oxide smoke within the gas enclosure. Alternatively, the photodetector is screened to receive incident light disorientated from the transmitted angle of polarization and an increase in the photodetector's response will correspond to an increase in concentration of sodium oxide within the gas enclosure.

T947,009

METHOD FOR RELEASING ADHESIVE-BACKED EMBLEMS, LABELS AND THE LIKE FROM SUBSTRATES USING A CHEMICAL RELEASE AGENT

Robert L. Ammons, 2237 Charsley Road, Kingsport, Tenn. 37660

Filed Feb. 24, 1975, Ser. No. 552,478
Int. Cl. B08b *3/08;* **B32b** *35/00;* **C11d** *7/50;* **D01f** *11/00*
U.S. Cl. 156—344
No Drawing. 10 Pages Specification

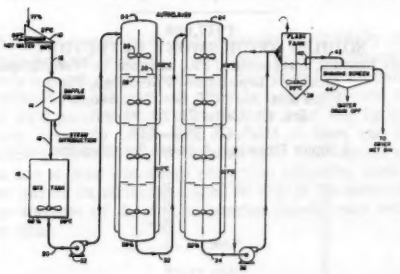
Method for releasing polyester, polyamide, polyurethane, polyvinyl chloride adhesive-backed emblems, labels, and seam joinings, and cyclic trimer polymer deposits from substrates by applying thereto gamma-butyrolactone in an amount sufficient to wet the emblems, labels, seam joinings and polymer deposits. Gamma-butyrolactone may be used alone or at least 25% by volumne in solution with water, or at least 25% by volume in solution with perchloroethylene, water and a surfactant, or at least 25% by volume in solution with a petroleum solvent, water and a surfactant, and at a preferred temperature of 70° F. to 175° F.

T947,010

PROCESS FOR PARTIAL DELIQUEFACTION OF CELLULOSE TRIACETATE PELLETS

Frank M. Volberg, 4409 Chickasaw Road, and Joe M. Mullins, Rte. 8, 5605 Old Island Road, both of Kingsport, Tenn. 37664

Filed Mar. 3, 1975, Ser. No. 554,375
Int. Cl. F26b *3/00*
U.S. Cl. 34—9
1 Sheet Drawing. 5 Pages Specification



Process for partially dewatering cellulose triacetate pellets by which the pellets in a water slurry form are preheated to about 99° C., and then are heated by gradually being increased in temperature at the rate of no more than about 3° to 5° C. per minute until reaching the temperature of about 120° C. to 127° C. The steps of preheating and heating include contacting the pellets with hot water. The step of gradually heating the pellets is accomplished above atmospheric pressure at about 25 to 40 p.s.i.g. The pellets shrink and exude moisture as they are treated and go from a moisture content of about 77–78% to a final partially dewatered moisture content of about 50%, and then are free drained or gravity drained for subsequent drying

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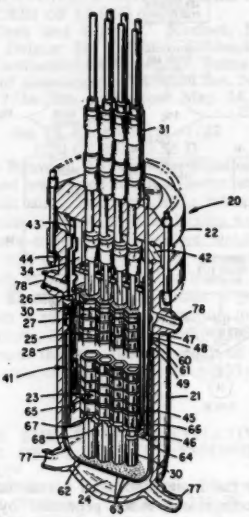
T947,011

INCREASE IN BREEDING A THERMAL BREEDER REACTOR

Alvin Radkowsky, Tel Aviv, Israel, assignor to the United States of America as represented by the United States Atomic Energy Commission

Continuation of abandoned application Ser. No. 341,449, Mar. 15, 1973. This application Apr. 17, 1975, Ser. No. 568,963
Int. Cl. G21c *3/28*
U.S. Cl. 176—18
4 Sheets Drawing. 11 Pages Specification

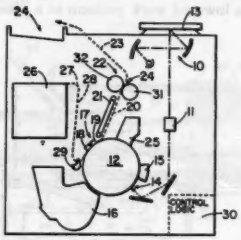


A light water breeder reactor has a plurality of fuel modules and reflector assemblies defining a core. Each of the fuel modules comprises a seed assembly, surrounded by a blanket assembly. The blanket assembly contains uranium-233 fissile fuel and thorium-232 fertile fuel. A reflector assembly contains thorium-232 fertile fuel and surrounds the grouped seed and blanket assemblies. According to the present invention, the fuel modules each additionally comprise an elongated fuel control assembly disposed between the seed assembly and the blanket assembly. The fuel control assembly is disposed for longitudinal movement in relation to the seed and blanket assemblies and is divided into upper and lower fuel regions. Each fuel region has a length approximately equal to the length of the seed and blanket assemblies with the upper fuel region containing essentially uranium-238 and the lower fuel region containing from ninety-five to ninety-nine weight percent uranium-238 and from one to five weight percent uranium-233. The fuel control assemblies are moveable with respect to the seed and blanket assemblies, whereby the upper fuel region is positioned in the reactor core during a first portion of core life until at least one half the converted Pu-239 has on the average a chance to fission or absorb neutrons, and the lower fuel region is positioned in the core during the remainder of core life.

T947,012
DRY HOT ROLL FUSER HAVING EARLY FUSING NIP CLOSURE

Fred Y. Brandon and Jerrold F. Zimmer, Boulder, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 28, 1975, Ser. No. 572,374
Int. Cl. G03g *15/00*; H05b *1/00*
U.S. Cl. 219—216
1 Sheet Drawing. 14 Pages Specification



A dry release hot roll fuser wherein the hot roll is internally heated, the surface of the hot roll is deformable, and a rigid backup roll is force biased into the hot roll to form an axial depression in the hot roll, which depression comprises the fusing nip. The fusing nip is closed prior to the arrival of a sheet to be fused. The early closing time interval is such as to cause the hot roll to complete at least one revolution against the cooler backup roll, prior to arrival of the first sheet to be fused.

In the standby mode, the fusing nip is open, and the hot roll temperature is controlled to be at a temperature higher than the desired fusing temperature. This higher temperature is desirable since it is known that the thick deformable surface on the hot roll will cause the fusing temperature to drop during fusing. Since the hot roll's surface is relatively thick, and formed of a heat insulator, such as silicone rubber, the drop which occurs is a result of the cooling effect of the first sheets to be fused.

After the early closing interval, the hot roll's fusing temperature has dropped to the vicinity of the optimum fusing temperature and the automatic temperature control system thereafter supplies just enough additional internal heat energy to offset the cooling effect of the sheets. The probability of the first sheet sticking to the hot roll has been reduced as a result of this roll early closing.

To accommodate the high standby temperature, the fusing nip is closed early—i.e. before a sheet arrives at the fusing nip. The time period of this early closure is critical, and has been found to be such as will produce at least one revolution of the hot roll prior to the arrival of a sheet to be fused. It has been found that this early closing of the fusing nip causes a rapid drop in the fusing nip temperature to approximately the optimum fusing temperature prior to arrival of the first sheet to be fused, and thereafter the temperature control system maintains the optimum temperature. Thus, wrap of the sheets about the hot roll is minimized.

REISSUES

JUNE 1, 1976

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

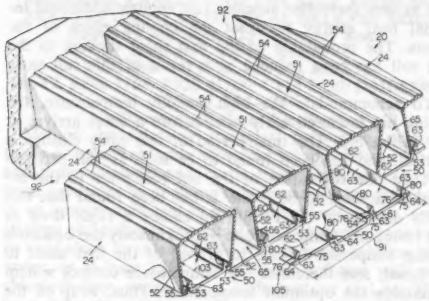
Re. 28,834
FLOOR CONSTRUCTION FOR AN ANIMAL ENCLOSURE AND METHOD OF MAKING SAME

Robert C. Johnson, Pikeville, Ky., assignor to Reynolds Metals Company, Richmond, Va.

Original No. 3,528,391, dated Sept. 15, 1970, Ser. No. 760,557, Sept. 18, 1968. Application for reissue May 29, 1975, Ser. No. 581,910

Int. Cl.[2] A01J *1/00*

U.S. Cl. 119—28 **26 Claims**



6. A floor construction [as set forth in claim 3] *for an animal enclosure comprising, a plurality of inverted substantially U-shaped channel members arranged in parallel spaced relation, each channel member having a bight defining a load-carrying surface and a pair of downwardly extending side walls terminating in inwardly directed fastening flanges, a plurality of connector clips fastening said channel members together, each connector clip having a base portion and sets of upwardly and outwardly extending fastening legs, each leg defining a laterally outwardly open recess which receives an associated fastening flange therewithin, and each given channel member having resilient means providing a normal resiliency therefor and holding its fastening flanges embraced within an associated set of recesses defined by the associated fastening legs and in grasping contact against the associated fastening legs so that each given channel member is fastened in position and supported by the fastening flanges at its lower end engaging said connector clips; in which floor construction said channel members are of substantially identical construction and the spacing between channel members is substantially less than the width of each load-carrying surface, and* in which each of said channel members has its downwardly extending side walls arranged in a converging manner so as to define a downwardly diverging passage between each immediately adjacent pair of channel members, each passage enabling animal wastes to be easily conveyed downwardly therethrough to provide a floor construction having optimum cleanliness.

Re. 28,835
WORK CABINET FOR SEWING MACHINE

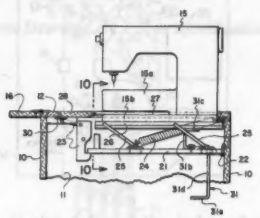
Kent S. Roberts, American Fork, Utah, and Stanley D. Roberts, Albuquerque, N. Mex., assignors to Roberts Mfg., Inc., American Fork, Utah

Original No. 3,788,716, dated Jan. 29, 1974, Ser. No. 278,222, Aug. 7, 1972. Application for reissue Aug. 15, 1975, Ser. No. 604,953

Int. Cl.[2] A47B *29/00;* **A47F** *05/08*

U.S. Cl. 312—29 **16 Claims**

1. A sewing machine cabinet, comprising walls defining a housing for receiving and storing a sewing machine, said walls including an apertured top wall providing a top work surface for the cabinet; a drop shelf spaced below said top wall under the aperture thereof and hingedly attached to a wall of the cabinet; latch means for normally holding said shelf in a substantially horizontal position; a sewing machine mount normally resting on said shelf and adapted to receive a sewing machine; link means attaching said mount to the shelf so as to permit raising of the mount, and of a sewing machine mounted thereon, from a lowered work position to a raised work position and vice versa relative to said shelf; and pivotally mounted lever means for raising and lowering said mount, said aperture in the top wall being sufficiently large to accommodate the sewing machine in its work positions and during the dropping thereof into storage position within the cabinet and the raising thereof from said storage position into a work position.



Re. 28,836
PROCESS FOR SIMULTANEOUSLY PRODUCING METHACRYLONITRILE AND BUTADIENE BY VAPOR-PHASE CATALYTIC OXIDATION OF MIXED BUTENES

Shigeru Saito, Fuchu; Jun Ishijura, and Yutaka Sasaki, both of Yokohama, all of Japan, assignors to Nitto Chemical Industry Co., Ltd., Tokyo, Japan

Original No. 3,859,326, dated Jan. 7, 1975, Ser. No. 273,282, July 19, 1972. Application for reissue July 24, 1975, Ser. No. 598,582

Claims priority, application Japan, July 23, 1971, 46-54660

Int. Cl.[2] C07C *121/02, 11/12*

U.S. Cl. 260—465.3 **4 Claims**

1. Process for simultaneously producing methacrylonitrile and butadiene which comprises contacting a mixture of butenes consisting essentially of isobutene and n-butene, oxygen and ammonia in vapor phase at a temperature of from about 350° to 500°C with a catalyst consisting of an oxide composition containing the elements in atomic ratio according to the formula

$$Fe_{10}W_aX_bMe_cO_d$$

wherein X is at least one element selected from the group consisting of phosphorus, boron and tellurium; Me is at least one element selected from the group consisting of vanadium and molybdenum; the subscripts denote atomic ratio and have the values:

a = 1–30

b = 0.01–15

c = 0.01–5;

and d is a value corresponding to the oxides formed from the above components by combination and is from 12 to 143, wherein said catalyst is produced by intimately mixing at least one compound of each of the respective elements in an aqueous system, heating to dryness and calcining at a temperature from about 400° to about 950°C for 2 to 48 hours.

Re. 28,837

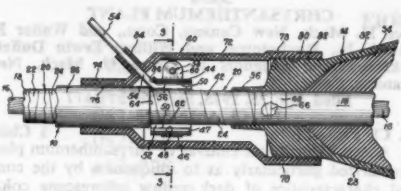
SHIELDING TAPE GROUNDING DEVICE FOR HIGH VOLTAGE CABLES

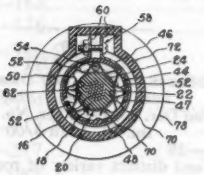
Frank A. Silva, Basking Ridge, N.J., assignor to Amerace Corporation, New York, N.Y.

Original No. 3,777,050, dated Dec. 4, 1973, Ser. No. 214,309, Dec. 30, 1971. Continuation of Ser. No. 112,146, Feb. 3, 1971, abandoned. Application for reissue Aug. 4, 1975, Ser. No. 601,810

Int. Cl.[2] H02G *15/02*; H01R *3/06*, *11/10*

U.S. Cl. 174—78 **47 Claims**





1. A shielding tape grounding device for use in connection with a shielded high voltage power cable of the type having an inner conductor, insulation surrounding the conductor, a shielding system including a metallic tape shield surrounding the insulation, and an outer jacket surrounding the metallic tape shield, said grounding device comprising:

clamping means, said clamping means including a sleeve of elastomeric material defining an inner surface portion with an internal diameter substantially greater than the external diameter of the metallic shield, said clamping means including means selectively operable for decreasing the internal diameter of said inner surface portion;

electrical contact means including a band of conductive material disposed within said elastomeric sleeve in juxtaposed relation to said inner surface portion, said band being adapted to extend circumferentially around at least a portion of a bared portion of said metallic tape shield, said electrical contact means having flexure means for enabling resilient flexure of at least a portion of the band in a radial direction relative to said bared portion of said metallic tape shield in response to a decrease in the internal diameter of said inner surface portion by the action of said selectively operable means whereby said at least portion of said band is adapted to resiliently engage said metallic tape shield when said grounding device is located on said cable with said band extending circumferentially around said at least portion of said metallic tape shield; and

a grounding conductor electrically connected to the band and adapted to extend radially outward beyond the clamping means when said grounding device is located on said cable as hereinaforesaid.

45. For use in connection with a shielded high-voltage power cable of the type having an inner conductor, insulation surrounding the conductor, a shielding system including a metallic tape shield surrounding the insulation and an outer jacket surrounding the metallic tape shield, apparatus comprising:

an elastomeric sleeve, said sleeve being adapted to be disposed on said cable in position to enclose at least a bared portion of said metallic tape shield, said sleeve having one end portion adapted to resiliently engage in watertight sealing relation the jacket on said cable and having another end portion adapted to engage in watertight sealing relation insulation on said cable or a corresponding surface of a shielded electrical connector or terminator connected to said cable, said sleeve having an aperture disposed in the wall thereof between said end portions,

an electric contact member disposed within said sleeve for engaging said bared portion of said metallic tape shield when said sleeve is disposed on said cable in position to enclose said bared portion of said metallic tape shield, *said member including means for enabling resilient flexure of at least a portion of said member in both a radial and a circumferential direction relative to the outer periphery of said metallic tape shield*; and

a ground conductor electrically connected to said contact member within said sleeve and extending through said aperture in said sleeve and beyond said sleeve.

PLANT PATENTS

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

GRANTED JUNE 1, 1976

3,896
CHRYSANTHEMUM PLANT

Walter H. Jessel, Jr., Doylestown, and William Erwin Duffett, Akron, Ohio, assignors to Yoder Brothers, Inc., Barberton, Ohio

Filed Apr. 16, 1975, Ser. No. 568,570

Int. Cl. A01h *5/00*

U.S. Cl. Plt.—75 **1 Claim**

1. A new and distinct cultivar of chrysanthemum plant characterized as to uniqueness by the combined characteristics of orange bronze inflorescence color, flat inflorescence form, decorative inflorescence type, up to 2.25 inches diameter across face of inflorescence at maturity, medium plant height, compact, semi-upright general appearance of plant, average natural season flowering date of September 22, and its average controlled flowering response period of 6 weeks.

3,897
CHRYSANTHEMUM PLANT

Grace H. Mack, New Canaan, Conn., and Walter H. Jessel, Jr., Doylestown, and William Erwin Duffett, Akron, Ohio, assignors to Grace H. Mack, New Canaan, Conn.

Filed Apr. 25, 1975, Ser. No. 571,476

Int. Cl. A01h *5/00*

U.S. Cl. Plt.—75 **1 Claim**

1. A new and distinct cultivar of chrysanthemum plant characterized particularly as to uniqueness by the combined characteristics of ivory white inflorescence color, flat inflorescence form, decorative inflorescence type, diameter of face of inflorescence up to 2.25 inches at maturity, short plant height, compact, semiupright growth habit, average natural season flowering date of Sept. 20, and its average controlled flowering response period of 6 weeks.

3,898
CHRYSANTHEMUM PLANT

Grace H. Mack, New Canaan, Conn., and Walter H. Jessel, Jr., Doylestown, and William Erwin Duffett, Akron, Ohio, assignors to Grace H. Mack, New Canaan, Conn.

Filed Apr. 25, 1975, Ser. No. 571,477

Int. Cl. A01h *5/00*

U.S. Cl. Plt.—75 **1 Claim**

1. A new and distinct cultivar of chrysanthemum plant characterized particularly as to uniqueness by the combined characteristics of dark yellow inflorescene color, flat inflorescence form, decorative inflorescence type, medium plant height, semi-spreading plant growth habit, average natural season flower date of October 1, average controlled flowering response period of seven weeks, and diameter of face of inflorescence up to 2 inches at maturity.

3,899
ROSE PLANT

R. Merrell Graham, 507 Olustee Ave., Lake City, Fla. 32055

Filed Dec. 30, 1974, Ser. No. 537,997

Int. Cl. A01h *5/00*

U.S. Cl. Plt.—20 **1 Claim**

1. A new and distinct variety of rose plant of the hybrid tea class, substantially as described and shown herein, characterized particularly by its continuous blooming during the growing season and its abundance of unique blooms having petals which curl back at maturity with the outer petals quilled and the center petals generally randomly oriented.

3,900
RHODODENDRON PLANT

John Kraynak, Sr., John Kraynak, Jr., and George A. Kraynak, Sharon, Pa., assignors to Kraynak's, Inc., Sharon, Pa.

Filed June 26, 1974, Ser. No. 483,388

Int. Cl. A01h *5/00*

U.S. Cl. Plt.—55 **1 Claim**

1. A new and distinct variety of rhododendron plant, substantially as shown and described, characterized by the distinctive color of its flower and foliage, and by its multiple blooming periods.

PATENTS

GRANTED JUNE 1, 1976

ERRATA

For CLASS	See PATENT NO.
063–015.65	3,959,989
092–160	3,960,057
112–228	3,960,089
339–145 R	3,960,278
062–002	3,960,322
254–067	3,960,359
254–139.1	3,960,360
254–168	3,960,362
351–176	3,960,442
030–346.54	3,960,608
202–185 R	3,960,668
206–534	3,960,713
260–112.5 R	3,960,720
526–237	3,960,823
526–085	3,960,824
526–206	3,960,825
526–103	3,960,826
424–273	3,960,882
252–465	3,960,975
357–040	3,961,340
356–244	3,961,346

PATENTS

GRANTED JUNE 1, 1976

GENERAL AND MECHANICAL

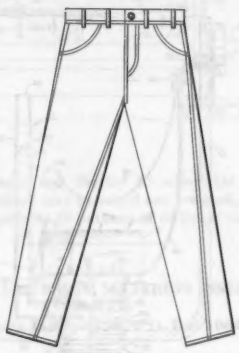
3,959,825
REVERSIBLE NECKTIE
John A. Hughes, 8031 S. Shore Drive, Chicago, Ill. 60617
Filed May 2, 1975, Ser. No. 573,881
Int. Cl.² A43D *25/06*
U.S. Cl. 2—146 **2 Claims**

1. A reversible four-in-hand necktie comprising: a first side, said first side having a first outside face bearing a first pattern, said first side having a first inwardly-curving hem formed integral with the outer periphery of the first outside face, said first outside face having a pair of relatively widened ends, said relatively widened ends being connected by a relatively narrow neck band; a second side symmetric with said first side, said second side having a second outside face symmetric with said first outside face, said second side having a second inwardly-curving hem formed integral with the outer periphery of the second outside face, said second side being connected to said first side with the first and second inwardly-curved hems adjacent to each other, said second outside face bearing a second pattern, said second outside face having a pair of relatively widened second ends, said relatively widened second ends being connected by a relatively narrow second neck band; and an interfacing having the same shape as said second outside face, said interfacing being positioned between said second outside face and said second inwardly-curving hem, said interfacing providing support and drape for said first side and said second side.

3,959,826
METHOD OF SKEWING TWILL FABRIC TO AVOID LEG TWIST
Karin Hakanson, San Francisco, Calif., assignor to Levi Strauss & Co., San Francisco, Calif.
Filed May 15, 1974, Ser. No. 470,075
Int. Cl.² A41D *1/10*
U.S. Cl. 2—227 **9 Claims**

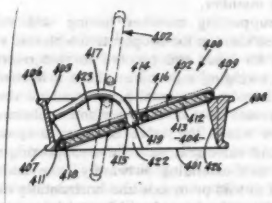
1. A method of preventing spiral twisting of long seams on denim garments made from twill fabrics comprising the steps of:

deliberately skewing the woven fabric in a direction to remove tension between warp and filling yarns in the twill, and maintaining the relatively tensionless relationship of the skewed fabric during the usual steps of finishing, cutting and sewing the fabric into garments whereby the relatively tensionless relationship between warp and



fill remoins substantially constant throughout the life of the garment.

3,959,827
HEART VALVE PROSTHESIS
Robert L. Kaster, 2730 Vagabond Lane, Wayzata, Minn. 55391
Continuation-in-part of Ser. No. 282,706, Aug. 8, 1972, Pat. No. 3,825,957. This application July 30, 1974, Ser. No. 493,022
Int. Cl.² A61F *1/22*
U.S. Cl. 3—1.5 **27 Claims**



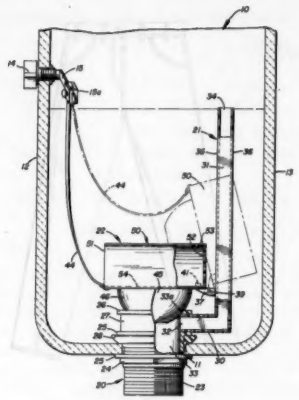
17. A heart valve prosthesis for controlling the flow of blood in a heart comprising: a base having a passage for carrying blood through the base and means for accommodating a suturing member used to secure the heart valve to heart tissue, valving means movable relative to the base to an open position to allow blood to flow through the passage in one direction and to a closed position to restrict the flow of blood in the opposite direction through the passage, means for holding the valving means in movable assembled relation with the base, and means associated with the valving means and means for holding the valving means for progressively moving the valving means from the open position to the closed position in response to a reduction of the pressure of the blood moving through said passage.

3,959,828

FLUSH VALVE AND OVERFLOW PIPE ASSEMBLY FOR A TOILET TANK

Ignacio Acevedo, 4066 Fenwick Road, Columbus, Ohio 43220

Filed Apr. 9, 1975, Ser. No. 566,215
Int. Cl.² E03D 1/34
U.S. Cl. 4—57 P 9 Claims



1. A flush valve and overflow pipe assembly for mounting in a liquid storage tank in cooperation with a downwardlyopening discharge outlet including:

a fitting adapted to be mounted in cooperation with said outlet and having an upwardly opening discharge passage provided with a valve seat at the upper end of said fitting;

an elongated, upstanding overflow pipe carried by said fitting in radially offset relationship to the discharge passage, said overflow pipe having a lower end in fluid communication with the discharge passage and an inlet at its upper end; and

a valve-carrying unit mounted on said overflow pipe for vertical swinging movement above said valve seat and comprising;

a valve member,

a valve-supporting member having said valve member mounted thereon for cooperation with said valve seat and having an inner end pivoted to said overflow pipe to permit swinging movement about a horizontal axis between a lower horizontal position where the valve member is closed on said valve seat and a substantially upright position where the valve member is spaced upwardly from said valve seat, said valve-supporting member having an axis extending outwardly from and substantially normal to said pivot axis and horizontally disposed when in said lower horizontal position, and a pair of counterbalancing, liquid receiving containers carried by said valve-supporting member at opposite sides of the axis thereof and spaced apart a distance greater than the width of said overflow pipe so as to receive said pipe therebetween when said valve-supporting member is swung to its upright position, said containers being of elongated tubular form having longitudinal axis disposed parallel to each other and to the axis of said valve-supporting member but in relatively offset relationship thereto at the side opposite to said valve member with a liquid capacity to provide a counterbalancing force when filled to maintain said valve-supporting member in an upright position,

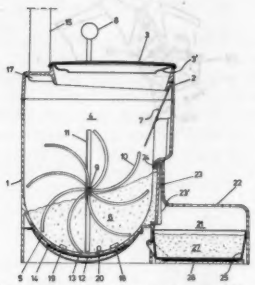
each of said containers having the inner ends adjacent said pivot axis closed and the other ends open and having a relatively small liquid discharge opening formed therein at the closed end to permit discharge of liquid therefrom at a predetermined rate when said valve supporting member and container are in the upright position whereby enabling the valve-supporting member to return to the lower horizontal position as said containers become emptied.

3,959,829

IMPROVEMENTS IN AND RELATING TO DRY CLOSETS

Peter Nordgren, Gustavsberg, Sweden, assignor to AB Gustavsbergs Fabriker, Gustavsberg, Sweden

Filed Feb. 14, 1975, Ser. No. 550,010
Claims priority, application Sweden, Feb. 19, 1974, 7402187-4
Int. Cl.² A47K 11/03
U.S. Cl. 4—131 9 Claims



1. A closet for the biological decomposition of human feces and urine and for the pasteurization of the decomposition product thereof, which comprises: a collecting vessel having an elevatable lid; a primary chamber forming the lower part of said collecting vessel, said chamber having a wholly closed bottom and being adapted to contain a bed of material adapted to biologically disintegrate feces and urine therein; controllable means adapted to heat bed material in said chamber; means for ventilating said chamber; mechanical means within said chamber adapted to mix feces and urine with said bed material and for aerating and moving the resulting mixture towards a secondary chamber; a removable smaller secondary chamber adjacent to and at substantially the same level as said primary chamber; a normally closed but openable port between said chambers adapted to permit substantially horizontal transfer of bed material from said primary chamber to said secondary chamber; and independently controllable heating means in said secondary chamber adapted to heat bed material in said chamber to pasteurizing temperature.

3,959,830

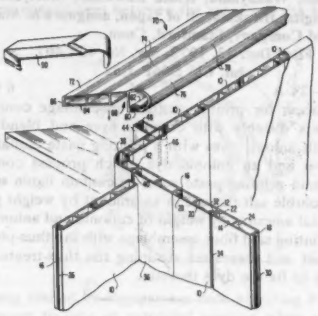
SWIMMING POOL

William A. van den Broek, Doylestown, Pa., assignor to KDI Sylvan Pools, Inc., Doylestown, Pa.

Filed Apr. 28, 1975, Ser. No. 572,578
Int. Cl.² E04H 3/16, 3/18; F16L 21/02
U.S. Cl. 4—172.19 19 Claims

1. A swimming pool structure comprising a plurality of interconnected vertically disposed elongated wall panels of plastic material defining the wall portion of said pool, said panels having complementary interlocking tongue and groove connecting means along opposed longitudinal side edges to prevent lateral separation of said panels, said tongue and

groove connecting means being additionally solvent bonded to prevent relative longitudinal movement of said panels relative



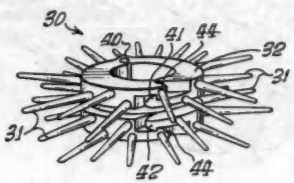
to each other and to permanently join said panels into an integral one-piece wall assembly.

3,959,831

WASH BASIN DRAIN FILTER

Jon Michael Hendricks, 600 Church Hill Road, La Habra, Calif. 90631

Filed Dec. 16, 1974, Ser. No. 532,753
Int. Cl.² A47K *1/14*
U.S. Cl. 4—287 **13 Claims**



1. A wash basin drain filter for entrapping elongated flexible fibers such as hair while permitting the passage of relatively small particulate matter and water, said filter comprising:

a pop-up drain plug having an upper enlarged top for forming a water tight seal with a wash basin, said drain plug having an elongated shank with a lower enlarged bottom end portion;

a filter member having a generally cylindrical body having an axially aligned opening positioned about the shank of a pop-up drain plug said opening being smaller than said enlarged top and said enlarged bottom end portion so that said member is held onto said drain plug; and

a plurality of spikes affixed to said body and protruding outwardly therefrom, the outer extremities of said spikes being resiliently moveable from their relaxed position to a position closer to the longitudinal axis of said cylindrical body.

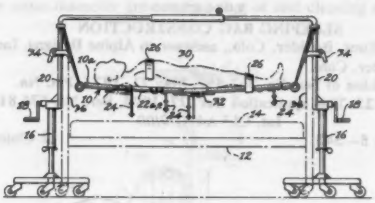
3,959,832

INVALID HAMMOCK

Vivian Parsons, Rte. No. 2, Box 277B, Shelbyville, Tenn. 37160

Filed June 25, 1974, Ser. No. 482,876
Int. Cl.² A47B *83/04*
U.S. Cl. 5—84 **14 Claims**

1. A bed for an invalid comprising a hammock suspended above the mattress of a bed, said hammock having a plurality of openings therein, said openings being positioned in the vicinity of contact points for shoulder blades, hip bones, end of spine and heels of a patient lying therein, said hammock



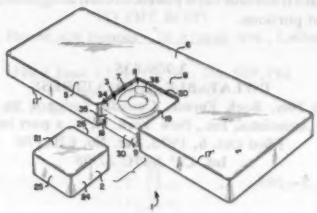
being joined at each end thereof to adjustable members whereby said hammock may be raised and lowered, said hammock being adjustable to fit patients of different sizes.

3,959,833

COMBINATION MATTRESS, MATTRESS INSERT, AND COMMODE

William Burke, Burke Incorporated, P.O. Box 1064, Mission, Kans. 66222

Filed June 4, 1975, Ser. No. 583,623
Int. Cl.² A61G *7/02*
U.S. Cl. 5—90 **6 Claims**



1. In combination:

a. a mattress formed of resilient material and having opposite side edge portions and opposite end portions and an intermediate portion, one of said side edge portions at said intermediate portion having walls extending therefrom transversely of the mattress, said transverse walls being connected by a longitudinal wall cooperating therewith and defining a laterally extending recess in the mattress for substantially one-half the width thereof;

b. a mattress insert formed of the same resilient material as the mattress and substantially corresponding in shape and size to said recess and removably received in said recess in said mattress and having side walls and an end wall frictionally engaged with the transverse walls and longitudinal wall defining said recess;

c. a utility insert interchangeable with said mattress insert and removably received in said recess in said mattress, said utility insert having a receptacle with side wall portions engaging the recess defining walls;

d. said utility insert having a removable cover supported on said side wall portions of said receptacle;

e. said side wall portions of said receptacle having an upper edge portion formed to define a rim;

f. said cover having a peripheral edge portion with a depending flange surrounding and in engagement with said upper edge portion of said receptacle side wall portions; and

g. said depending flange of said edge portion of said cover having an exterior surface adapted to be in frictional

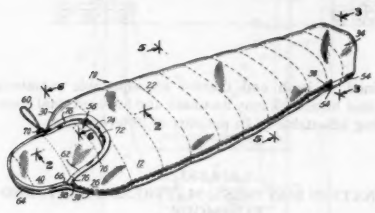
engagement with said walls defining said recess in said mattress.

3,959,834

SLEEPING BAG CONSTRUCTION

Harry Hunt, Boulder, Colo., assignor to Alpine Designs, Inc., Boulder, Colo.

Division of Ser. No. 362,497, May 21, 1973, Pat. No. 3,857,125. This application Dec. 27, 1974, Ser. No. 536,813
Int. Cl.² A47G 9/00
U.S. Cl. 5—343 2 Claims



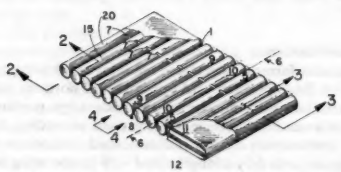
1. In a sleeping bag comprising quilted front and back panels sewn together along a portion of a side edge and selectively fastenable together along at least an adjacent portion of said side edge, a baffle tube extending along said side edge entirely longitudinally of both said portions and secured with at least one of said front and back panels entirely longitudinally along both said portions.

3,959,835

INFLATABLE AIR MATTRESS

Rudolph Nos, Rock Forest, Canada, assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Oct. 6, 1975, Ser. No. 620,170
Int. Cl.² A47C 27/08
U.S. Cl. 5—368 8 Claims



1. An air mattress comprising a plurality of rubber-like tubes, each having a longitudinal axis lying within a first plane, each of said tubes engaging neighboring said tubes along joining lines lying within said first plane, each of said tubes having the same length, the free ends of said rubber-like tubes forming two parallel planes transverse to said longitudinal axis and said first plane, a plurality of relatively shorter interconnecting hoses forming an air passage between adjoining said rubber-like tubes the axis of each lying in an air passage line transverse said longitudinal axis, an air valve fastened to one of said rubber-like tubes, the shaft of a solid metallic rivet cemented within a rubber-like ring, said ring cemented to the interior surface of the free end of each of said rubber-like tubes, an overall waterproof fabric-like casing enclosing said plurality of rubber-like tubes, said interconnecting hoses, said metallic rivets, said rubber-like rings, and said valve, a zipper closure device lying within said first plane adapted to fasten free edges of said casing to form a unitary enclosure, said casing providing parallel lateral second and third planes centrally between which lies said first plane in parallel relationship thereto.

3,959,836

PRINTING PROCESS

Eichiro Ueno, Wakayama; Hideo Kawasaki, Moriyama, and Syozo Shigita, Hirakata, all of Japan, assignors to American Cyanamid Company, Stamford, Conn.

Filed Dec. 13, 1973, Ser. No. 424,407
Int. Cl.² D06P 3/82
U.S. Cl. 8—21 A 6 Claims

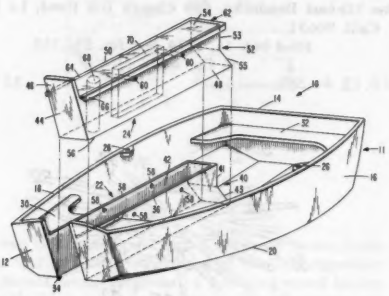
1. A process for printing a fiber assemblage comprising acrylic fibers dyeable with cationic dyes and blend fibers dyeable with anionic dyes with a printing paste containing a cationic dye and an anionic dye which process comprises preparing said printing paste so as to contain lignin sulfonic acid or a soluble salt thereof in an amount by weight greater than the total amounts by weight of cationic and anionic dyes present, printing said fiber assemblage with the thus-prepared printing past and thereafter steaming the thus-treated fiber assemblage to fix the dyes thereon.

3,959,837

DINGHY WITH MAST WELL

Robert W. Archibald, 1500 S. 20th Ave., Hollywood, Fla. 33020

Filed Apr. 28, 1975, Ser. No. 572,485
Int. Cl.² B63B 35/00
U.S. Cl. 9—2 R 10 Claims



1. A dinghy adapted to be stowable aboard a masted boat, said dinghy comprising:

a hull having exterior sides and a bottom, said exterior sides including a bow, a stern, and side walls;

a mast receiving slot extending inwardly in said hull from one of said exterior sides of said hull; and

a plug removably securable in said mast slot whereby said dinghy with said plug removed is stowable aboard said boat with the mast being received in said mast slot.

3,959,838

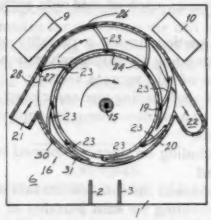
UNDERWATER CLEANING

Harvey John Hannah, 514 Kensington Road, Wattle Park, Adelaide, South Australia, Australia (50666)

Filed Feb. 28, 1974, Ser. No. 446,722
Int. Cl.² E04H 3/20; A47L 9/04
U.S. Cl. 15—1.7 2 Claims

1. An underwater surface cleaning apparatus for swimming pools including a body adapted to be drawn across a surface to be cleaned, a brush rotatably supported with respect to the body so as to engage against a surface of the swimming pool, a water operable motor adapted to operate by reason of water drawn from that surrounding the apparatus and sucked through the motor whereby to effect rotation of the drive shaft of the motor, the drive shaft being coupled to the brush to effect the rotation of the brush and effect a cleaning action on the engaged underwater surface, the motor including a rotor and a housing, the rotor being within the housing and having

vanes acting therebetween and following the rotor, an inlet port and an outlet port being formed in the housing and the vanes being caused by engagement with the housing to adapt a sealing engagement between the rotor and the housing and



also being caused by engagement with a guiding track within the housing to take an extended position when moving between the inlet port and the said outlet port, and being caused to take a collapsed position when moving from a position adjacent said outlet port to adjacent said inlet port.

3,959,839

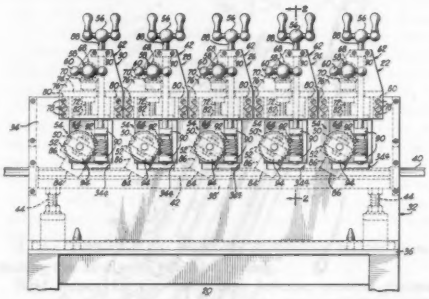
SCRAPING APPARATUS

Steven Y. Bradley, Geneva, Ill., assignor to Masonite Corporation, Chicago, Ill.

Filed June 23, 1975, Ser. No. 589,207

Int. Cl.² B23D 1/00

U.S. Cl. 15—93 R **14 Claims**



1. Apparatus for scraping a surface of a substrate comprising:

substrate support means for supporting a substrate and defining a path of travel of said substrate through said apparatus,

scraping blade support means for supporting a flexible scraping blade for contact against a surface of said substrate moving along said path,

a flexible scraping blade secured in said scraping blade support means to form an arcuately curved scraping edge in contact against said substrate, and

means for adjusting the contacting pressure of said arcuate scraping blade edge against said surface of said substrate.

3,959,840

PIPE CLEANING APPARATUS

Tadayoshi Sato, No. 117, Mizumoto Koai Kamimachi, Katsushika, Tokyo, Japan

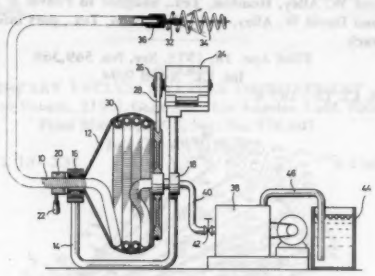
Filed Feb. 12, 1975, Ser. No. 549,378

Claims priority, application Japan, Feb. 13, 1974, 49-17358[U]

Int. Cl.² B08B 9/02

U.S. Cl. 15—104.3 SN **3 Claims**

1. A pipe cleaning apparatus comprising in combination: a rotatable and extensible cleaning member including a coil spring having the convolutions thereof in closely engaging relation and a flexible tube positioned concentrically therein; a source of high pressure water connected to one end of said flexible tube and a dischaerge nozzle mounted in and extending from the other end of said flexible tube; an auger having an outer diameter greater than that of said cleaning member



connected to and extending from the end of said spring in surrounding relation to said nozzle; said nozzle having at least two diverging discharge outlets whereby a divergent stream of said high pressure water is discharged directed towards the peripheral portion of said auger; and means for rotating and advancing said cleaning member into the pipe to be cleaned.

3,959,841

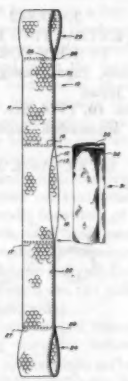
APPARATUS FOR APPLYING LIQUID PREPARATIONS TO THE BODY

Juliana S. Horne, c/o Hoopes - 24 Aragon Ave., Latham, N.Y. 12110

Filed June 23, 1975, Ser. No. 589,198

Int. Cl.² A47K 7/03

U.S. Cl. 15—104.94 **8 Claims**



1. Apparatus for use by a person for applying liquid preparations, such as lotions, creams, and the like, across portions of the body of said person, comprising

an integral elongated reticulated fabric folded along its major axis to form a body of double thickness so that one edge of said elongated fabric along its length is characterized by such fold and the opposite edge of said fabric along its length is characterized by overlapped bare terminations, said fabric having two spaced lines of transverse stitching centrally located so as to form a pocket therewithin, said fabric having longitudinal stitching along said bare terminations extending outwardly from said pocket, and loops formed on opposite ends of said

elongated fabric by transverse stitching of folded-over ends of said fabric; and

a disposable pad adapted to be inserted into said pocket.

3,959,842

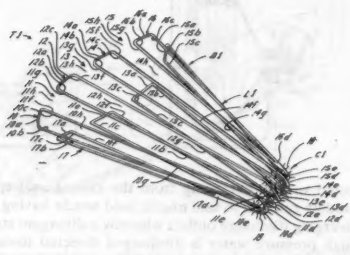
TONGUE TOOTHBRUSH

David W. Alley, Houston, Tex., assignor to Pravel & Wilson and David W. Alley, both of Houston, Tex., part interest to each

Filed Apr. 18, 1975, Ser. No. 569,369

Int. Cl.² A46B 9/04

U.S. Cl. 15—167 R 17 Claims



1. A tongue toothbrush adapted to be mounted with a tongue for cleansing teeth, comprising:

a hollow flexible body member adapted to receive the tongue and adapted to releasably engage the exterior portion of the tongue when mounted therewith;

said body member including a plurality of adjacent, spaced, yieldable loops adapted to surround the tongue; and,

means for cleansing the teeth by appropriate movement of the tongue, said cleansing means mounted with said body member adjacent the tip of the tongue when said body member is mounted with the tongue.

3,959,843

APPARATUS FOR EXTRACTING LIQUID FROM CLOTH IN ROPE FORM

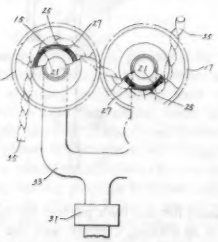
Rikizo Yokota, Kyoto, Japan, assignor to Uenoyama Kiko Co., Ltd., Kyoto, Japan

Filed Oct. 10, 1974, Ser. No. 513,560

Claims priority, application Japan, Oct. 10, 1974, 49-117526

Int. Cl.² A47L 5/38

U.S. Cl. 15—306 A 5 Claims



1. An apparatus for extracting liquid from cloth in rope form comprising

a rotary roller including a groove therein for receiving and guiding the rope form cloth which has liquid content absorbed therein and a predetermined maximum providing a first predetermined curvature;

said groove formed with an arcuate central inner section and two connected side sections, each side section connected respectively on opposite sides of said central section and extending outwardly and radially therefrom to provide a generally U-shape for said groove;

said arcuate section having a second predetermined curvature considerably larger than said first predetermined curvature of the rope form cloth to provide substantial spacing between each of said side sections and the rope form cloth;

said arcuate section having a plurality of small apertures radially extending therethrough around the entire circumference of said arcuate section;

a fixed hollow shaft having one end closed and the other end connected to a vacuum pump for applying a suction force to said shaft;

said shaft including an opening formed in a portion of its surface; and

said roller mounted for rotation on said shaft in a location thereon providing for said plurality of apertures to pass over said opening during each revolution of said rotary roller whereby the liquid content of said rope form cloth is extracted therefrom.

3,959,844

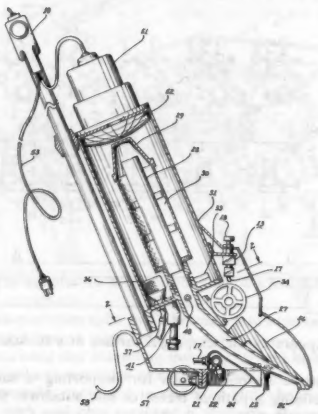
CARPET SOIL EXTRACTOR

Gilbert G. Cyphert, Phoenix, Ariz., assignor to Chemko Industries, Inc., Phoenix, Ariz.

Filed Feb. 5, 1975, Ser. No. 547,139

Int. Cl.² A47L 7/00

U.S. Cl. 15—320 6 Claims



1. In a manually propelled carpet cleaning apparatus having an upwardly extending handle and roller means for supporting said apparatus and for serving as a pivot point about which said apparatus is pivoted into and out of operative engagement with the carpet, said apparatus including a source of incoming water, a container for housing a cleaning agent, a mixer for metering the cleaning agent into the incoming water to produce a cleaning solution and means for generating a partial vacuum, the improvement comprising in combination:

a. a plurality of nozzles for directing the cleaning solution onto and into the carpet;

b. a shroud disposed about said nozzles for limiting splatter of the cleaning solution;

c. non-rotary agitator brush means disposed external to said shroud for engaging the pile of the carpet and stimulating penetration of the cleaning solution into the pile to loosen dirt contained in the carpet;

d. mouth means disposed in contacting relationship with the carpet, said mouth means being in fluid communication

with the vacuum means for scavenging the cleaning solution and loosened dirt from the carpet;

e. weight means for urging pivotal movement of said apparatus about the roller means to bias said agitator brush means and said mouth means against the pile of the carpet;

f. filter means disposed intermediate the vacuum means and said mouth means for removing the dirt contained within the scavenged cleaning solution, said filter means including deflection means for deflecting the cleaning solution away from the vacuum means; and

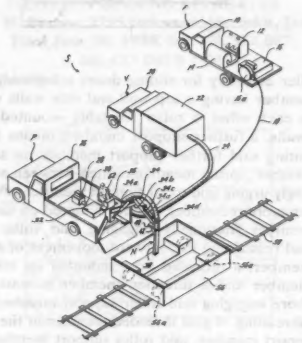
g. a tank for receiving the filtered cleaning solution flowing through said filter means.

3,959,845

APPARATUS AND METHOD FOR CLEANING MINING CARS

Robert R. Cradeur, Sulphur, La., and Ronald Webb Holloway, Dunbar, W. Va., assignors to Browning-Ferris Industries, Inc.

Filed Aug. 26, 1974, Ser. No. 500,289
Int. Cl.[2] A47L 7/00, 9/00
U.S. Cl. 15—321 3 Claims



1. An apparatus for cleaning particulate matter from a mining car at a work site, comprising:

fluid means for providing high volume, positive pressure water including separate motor powered fluid means transport vehicle independently mobile and movable from one work site to another and having a fluid pump and fluid reservoir therewith and a high pressure water line extending from said fluid reservoir of said fluid vehicle to the mining car at the work site for loosening packed particles in the mining car;

vacuum means for providing high volume, negative pressure including a separate motor powered vacuum means transport vehicle independently mobile and movable from one work site to another and having a vacuum pump therewith and a vacuum tube extending from said vacuum pump of said vacuum vehicle to the mining car for withdrawing the loosened particles from the mining car at the work site;

nozzle means mounted with said high pressure water line and said vacuum tube for vacuum flow for directing said high pressure water against packed particles within the mining car to loosen said particles and for withdrawing said loosened particles and water from the mining car;

positioning means for positioning said nozzle means within the mining car, said positioning means including a separate motor powered positioning means transport vehicle being independently mobile and movable from one work site to another and having a support mechanism for movably supporting said nozzle means; and,

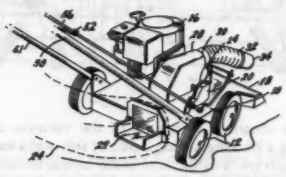
said fluid means and said vacuum means coacting simultaneously at said nozzle means for directing said high pressure water against packed particles within the mining car to loosen the same and simultaneously withdraw the packed particles and water from the mining car, and wherein said support mechanism of said positioning means is a hydraulically operated back-hoe type mechanism.

3,959,846

ROTARY VACUUM SWEEPER IMPROVEMENT

Haruma Yasuda, 219 N. Gage Ave., Los Angeles, Calif. 90063

Filed May 19, 1975, Ser. No. 578,607
Int. Cl.[2] A47L 5/14
U.S. Cl. 15—331 6 Claims



1. In a rotary vacuum sweeper of the type adapted to be rolled over a sidewalk or other flat horizontal surface and to pick up grass cuttings, dirt and other forms of debris, such type of sweeper having a wheeled carriage body including a housing, a rotary blower mounted on said carriage body within said housing and having blower inlet means disposed below the carriage body and adjacent to, and directed against the surface on which the carriage body is disposed for rolling movement, and a blower outlet duct within said housing, said duct extending from said housing in a first direction and terminating in an opening serving as a discharge passage for debris picked up through the blower inlet means by the low pressure condition therein created upon the rotation of the blower, power means to rotate said blower at a sufficient speed of rotation to create such low pressure condition at the inlet means, and handle means extending upwardly and angularly from said carriage body whereby said wheeled carriage may be locomoted by a force provided by an operator of the sweeper, the improvement which comprises:

A. duct means mounted on said housing and having an outlet directed generally forwardly of said carriage body;

B. flexible hose means, said hose means having one end attached onto said outlet of between duct means and its other end pointed downwardly and adapted to be swung through a predetermined arc the radius of which is centered on said carriage body;

C. valve means disposed in said blower outlet duct, said valve means being movable betwee a first position wherein it provides substantially no interference with the flow of air from said blower to the discharge opening of said duct, and a second position wherein the flow of substantially all air through said outlet duct is diverted from said outlet opening to said duct means from whence it passes through said flexible hose means; and

D. articulated control means including a rod extending upwardly from said carriage body and terminating in its upper extremity in a handle whereby the operator of said sweeper may, by grasping said handle and pushing the rod downwardly, first shift the said valve means between its first and second positions, and when said valve means is disposed in said second position, the operator may further direct said hose outlet in any direction within its said predetermined arc by rotating the rod by its handle.

3,959,847

FLOOR CLEANING APPARATUS

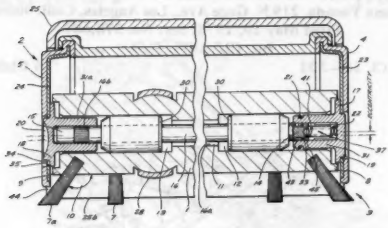
Heinz Kaulig, Wuppertal, and Gerhard Orth, Solingen, both of Germany, assignors to Vorwerk & Co. Elektrowerke KG, Wuppertal, Germany

Filed Apr. 2, 1974, Ser. No. 457,231

Claims priority, application Germany, Apr. 12, 1973, 2318425

Int. Cl.² A47L 9/06

U.S. Cl. 15—368 14 Claims



1. Floor cleaning apparatus of the vacuum cleaner type comprising a housing having a pair of side walls each provided with an aperture; a cylindrical brush in said housing extending between said side walls and turnable about a horizontal axis, said brush having a brush body provided with hollow end portions extending along said axis; and means for adjusting said brush body relative to said housing, said adjusting means having parts extending into said hollow end portions of said brush body, other parts mounted in said side walls of said housing and including eccentrics turnable in said apertures in said side walls, and means for arresting at least one of said eccentrics in a selected turned position, said arresting means including at least one detent projection on one of said one eccentric and the associated side wall, and a plurality of complementary detent recesses in the other of said associated side wall and said one eccentric for receiving said detent projection, and means in the other eccentric for resiliently biasing said one eccentric toward said associated side wall.

3,959,848

VACUUM CLEANER NOZZLE CONSTRUCTION

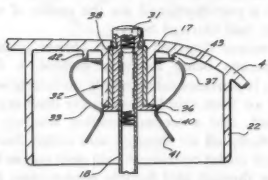
Eberhard Rother, Wuppertal, Germany, assignor to Vorwerk & Co. Elektrowerke, Wuppertal, Germany

Filed Jan. 25, 1974, Ser. No. 436,693

Claims priority, application Germany, Feb. 8, 1973, 2306101

Int. Cl.² A47L 9/06

U.S. Cl. 15—372 6 Claims



1. In a vacuum cleaner, a nozzle unit comprising a housing having an opening; a brush disk located in said opening and having bristles extending outwardly therefrom; a tubular socket on said housing; mounting means mounting said disk for rotation about an axis which extends substantially normal to the plane of said opening, including a journal pin extending to said brush disk and having a first end portion rotatably received in said socket and a second end portion, and a bearing ball between and in contact with said second end portion and said disk so as to form a single-point bearing; and brush-disk changing means in the region of said tubular socket for ejecting said mounting means from said socket, thereby disconnecting said disk from said housing and facilitating rapid installation and removal of said brush disk in said housing.

3,959,849

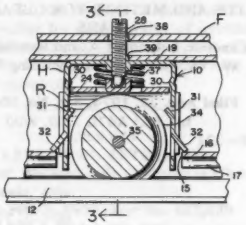
ROLLER ASSEMBLY FOR SLIDING DOORS

Robert J. Marquardt, Miami, Fla., assignor to Miller Industries, Inc., Miami, Fla.

Filed Aug. 8, 1975, Ser. No. 602,972

Int. Cl.² E05D 13/02

U.S. Cl. 16—105 3 Claims



1. A roller assembly for sliding doors comprising a roller support member having a top wall and side walls in spaced relation to each other, a roller rotatably mounted between said side walls, a further support member, means telescopically mounting said further support member on said roller support member, spring means mounted between said members yieldingly urging said roller support member outwardly of said further support member, means mounted on said further support member frictionally engaging said roller support member and restraining the outward movement of said roller support member, a threaded bore mounted on said further support member and a threaded member mounted in said threaded bore engaging said roller support member whereby upon the threading of said threaded member in the direction of said support member, said roller support member is compelled to slide past said restraining means, and said spring means effecting an outward sliding movement of said roller support member.

3,959,850

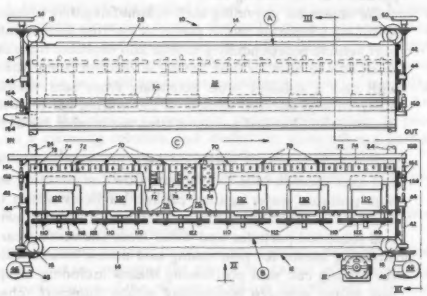
COUNTER-ROTATING FOWL PICKER

Edward J. Crane, Ottumwa, Iowa, assignor to Barker International, Inc., Marietta, Ga.

Filed July 30, 1974, Ser. No. 493,023

Int. Cl.² A22C 21/02

U.S. Cl. 17—11.1 R 31 Claims



1. A fowl picking machine comprising a frame; a pair of horizontally spaced, longitudinally extending picking assem-

blies supported on said frame and defining a generally horizontally and longitudinally extending picking channel therebetween through which a fowl is moved for picking and cleaning feathers from the same; each picking assembly including a plurality of individual, axially aligned drum assemblies; each of said drum assemblies including a pair of counter-rotating, axially aligned drums which are immediately adjacent and side by side with one another and each rotate in a plane generally transverse to said longitudinally extending picking channel, each of said drum assemblies also including rotation support means for rotatably supporting each pair of drums separately from the next adjacent pair or pairs of drums such that said assemblies provide ease of access, maintenance and repair for each of said pairs of drums; said drums each including a plurality of radially extending, flexible, picking fingers, drive means for individually and separately driving each pair of counter-rotating drums including means for simultaneously rotating said drums in said pair in directions opposite one another; each of said drums in one of said picking assemblies being generally opposite to and rotating through said channel in the same direction as a corresponding drum in the other of said picking assemblies.

3,959,851

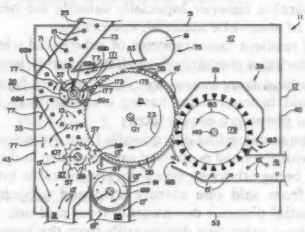
COTTON GINNING APPARATUS

Woodrow W. Bledsoe, 2775 Dalewood, Memphis, Tenn. 38127

Filed June 30, 1975, Ser. No. 592,067

Int. Cl.² D01B *1/04*

U.S. Cl. 19—48 A **12 Claims**



1. Apparatus for removing and segregating seeds from seed cotton, said apparatus comprising frame-like housing means, a prime mover for rotatably driving certain structure of said apparatus, a ginning saw cylinder for engaging and holding the fibers of the seed cotton, said ginning saw cylinder being journaled to said housing means and being coupled to said prime mover for rotation in a predetermined direction about a horizonatal axis, entry duct means disposed adjacent said ginning saw cylinder for admitting the seed cotton into said housing means, cylinder-like kicker means disposed within said housing means and extending across the path of the seed cotton being admitted therein for agitating and directing the seed cotton onto said ginning saw cylinder, said kicker means being journaled to said housing means and being coupled to said prime mover for rotation in a predetermined direction about a horizontal axis, first outlet duct means leading outwardly from said housing means for receiving and discharging at least a first portion of the seeds which have been removed from the seed cotton, grid means interposed between said entry duct means and said first outlet duct means for preventing passage into said first outlet duct means of the locks of cotton and for permitting passage therethrough of the segregated seeds, spiral shaped ginning roller means coacting with said ginning saw cylinder for engaging and removing the seeds from the seed cotton, said ginning roller means being journaled to said housing means and being coupled to said prime mover for rotation in a predetermined direction about a horizontal axis with the periphery thereof being a predetermined distance from the periphery of said ginning saw cylinder, doffing means for subsequently removing the lint cotton from said ginning saw cylinder, and lint cotton duct means leading outwardly from said housing means for receiving the lint cotton from said doffing means and for directing the lint cotton to further processing apparatus.

3,959,852

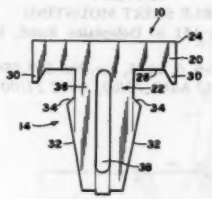
FASTENER FOR FENCE CONSTRUCTION

John J. Sasena, Parma, Ohio, assignor to Eaton Corporation, Cleveland, Ohio

Filed Dec. 24, 1974, Ser. No. 536,146

Int. Cl.² A44B *21/00*

U.S. Cl. 24—73 B **12 Claims**



1. A one-piece spring fastener for mounting a wire having a given maximum diameter generally perpendicularly to a channel-shaped support, said wire mounted for movement relative to the support along the axis of the wire, said fastener comprising two substantially flat, spaced apart, generally parallel, T-shaped members joined along substantially the entire lengths of the tops thereof by a bight portion extending generally perpendicularly therebetween, each of said T-shaped members comprising a top portion having a first edge from which said bight portion extends and a second, generally parallel edge from which a base portion extends, said top portions and said bight portion defining a trough for receipt of said wire, said base portions being of generally dart configuration for forcable receipt inbetween and retention by the inturned flanges of said channel-shaped support.

3,959,853

FASTENING PEG AND METHOD OF MAKING SAME

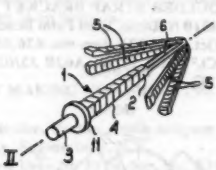
Maryan Talan, 68 rue Bonaparte, 75006 Paris, France

Filed Feb. 3, 1975, Ser. No. 546,824

Claims priority, application France, Feb. 14, 1974, 74.04973

Int. Cl.² A44B *21/00*; F16B *13/04*

U.S. Cl. 24—73 PF **6 Claims**



1. A device for fastening an object to a support comprising an expansible peg adapted to be driven into a hole of the support; an expansion plug located centrally in said expansible peg and having a front end and a rear end, said expansion plug having a polygonal cross section and said expansible peg comprising a plurality of legs disposed about said expansion plug, the number of said legs corresponding to that of the faces of said plug; flexible connecting strips connecting the front end of each leg to the front end of said plug, said con-

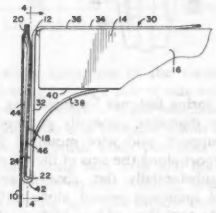
necting strips are folded on themselves in such a manner that the rear ends of said legs are spaced from the rear end of said plug; and a flange provided on said plug adjacent the rear end thereof for limiting driving of said plug into the peg-forming portion of the device, said legs, said strips and at least a portion of said plug being integrally molded from plastic material and the lengths of said strips being such that they permit by the distortion thereof forward movement of said plug relative to said legs during driving of the device into the hole, the external faces of said legs having a substantially convex shape so that the device has a circular cross section when said legs are folded against said plug.

3,959,854

TABLE SKIRT MOUNTING

Edward M. Lewis, 151 S. Delaplaine Road, Riverside, Ill. 60546

Filed Feb. 6, 1975, Ser. No. 547,559
Int. Cl.² A44B 13/00; A47C 21/00
U.S. Cl. 24—84 B 4 Claims



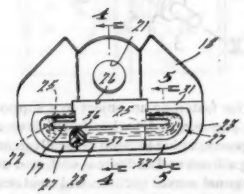
1. In combination with a skirt forming member having a top marginal portion providing downwardly opening pocket formations, a mounting clip for securing said skirt member to the edge portion of a support member in the form of a table top margin, which mounting clip comprises a base plate adapted to seat against the edge of said support member, clamp means extending from said base plate for frictionally securing the clip to the support member and an upwardly directed finger member adapted to seat in a downwardly opening pocket formation on the skirt, including spaced, resilient top and bottom support engaging finger members and said bottom finger member being connected to the bottom portion of said upwardly directed skirt engaging finger member so as to swing said skirt engaging finger member toward said base plate when said top and bottom support engaging finger members are urged apart.

3,959,855

SHOULDER STRAP BRACKET

Robert C. Fisher, 4210 N. Dixie, West Palm Beach, Fla. 33407

Filed Oct. 29, 1975, Ser. No. 626,656
Int. Cl.² B60R 21/10; A62B 35/02
U.S. Cl. 24—163 FC 9 Claims



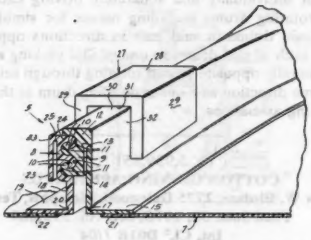
1. In a bracket for supporting a shoulder strap which extends through a slot therein, first and second plastic end elements in said slot, said elements being of U-shape and having a groove in the outer edge thereof for receiving the edge of the bracket slot, and a third plastic element having a grove along one edge insertable between said end elements to form a continuous plastic wall covering the outermost edge and ends of the slot.

3,959,856

INTERLOCKING SEPARABLE FASTENER

Steven Ausnit, 124 E. 61st St., New York, N.Y. 10021

Filed Mar. 6, 1975, Ser. No. 555,881
Int. Cl.² A44B 19/14, 17/00
U.S. Cl. 24—201 C 2 Claims



1. A separable fastener especially suitable for heavy duty enclosures of sheet-like material, comprising:

a pair of resilient fastener strips of substantial width vertically having a plurality of parallel separably interlocking longitudinal complementary rib and groove formations;

one of said fastener strips having a substantially flat head portion forming a crown face;

a riser flange extending downwardly from a resilient hinged joint with the head portion of said one strip and such riser flange being otherwise free from and movable toward and away from said one closure strip and projecting to a substantial distance downwardly from said one strip;

a riser flange extending downwardly from the lower edge of said other of said closure strips;

each of said riser flanges having on its lower edge a respective foot flange resiliently hingedly connected thereto and the foot flanges extending in opposite directions for attachment to margins of a sheet-like enclosure toward one another whereby the interlocked fastener strips will normally act to retain the sheet margins adjacent to one another and the hinged connections will permit a range of pulling apart of the enclosure margins without interfering with the interlocking coaction of the rib and groove formations;

a pull flange for disengaging the fastener strips connected to the head portion of said other fastener strip and extending freely downwardly therealong; and

said riser flange extending from said head portion of said one strip and said pull flange providing parallel slider surfaces substantially normal to said flat head portion, whereby to accommodate a U-shaped slider having a flat surfaced body portion engageable with said head portion and downwardly extending flange legs engageable with said flat surfaces.

3,959,857

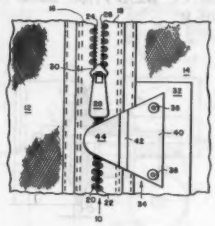
QUICK OPENING DEVICE FOR A SLIDE FASTENER

Milton L. Stephens, Meadville, Pa., assignor to Textron, Inc., Providence, R.I.

Filed June 4, 1975, Ser. No. 583,699
Int. Cl.² A44B 19/00
U.S. Cl. 24—205 R 15 Claims

1. A slide fastener installation comprising

a pair of carrier means, each having an edge portion,
said edge portions being oppositely disposed to each other,
interlocking elements on each edge portion,
the interlocking elements on one edge portion adapted to be engaged and disengaged with the interlocking elements on the other edge portion,



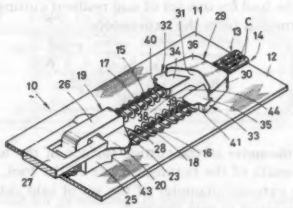
slider means movably disposed on said pair of carrier means for engaging and disengaging said interlocking elements whereby the slide fastener installation is actuated between closed and opened positions, respectively, and
emergency opening means mounted on said carrier means and including means movable in between engaged interlocking elements causing disengagement thereof whereby the slide fastener installation is rapidly actuated from its closed position to its opened position.

3,959,858

BRIDGE TOP STOP FOR SLIDE FASTENERS

Takeo Fukuroi, Uozu, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Japan

Filed Sept. 2, 1975, Ser. No. 609,796
Claims priority, application Japan, Sept. 4, 1974, 49-106333[U]
Int. Cl.² A44B *19/36*
U.S. Cl. 24—205.11 F **3 Claims**



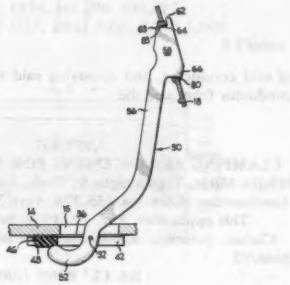
1. In a slide fastener of the type which comprises a pair of oppositely disposed stringer tapes each carrying along its one longitudinal edge a row of interlocking fastener elements and a slider having upper and lower wings which are inter-connected by a diamond, and side flanges which project inwardly from either one of the upper and lower wings or both and which together with the diamond form a guide channel including throats for the passage of the fastener elements therethrough, a bridge top end stop which comprises a body mounted astride said stringer tapes and having its rear end wall offset complementarily in shape to a front end face of the slider, a pair of spaced-apart tongues formed integral with said body and reduced in thickness so that their upper surfaces lie at a level below an upper surface of said body, and a pair of laterally projecting flange-seats formed on said tongues, said tongues being adapted to be inserted into said throats of the slider and between said slider wing and said stringer tapes with the diamond interposed between said tongues and with said projecting flange-seats of the tongues engaged with said flanges of the slider.

3,959,859

CASKET CAP BRACE

Joseph A. Stein, Jr., Greensburg, and Carl A. Wettering, Batesville, both of Ind., assignors to Batesville Casket Company, Batesville, Ind.

Filed Sept. 23, 1974, Ser. No. 508,412
Int. Cl.² A61G *17/00*
U.S. Cl. 27—18 **12 Claims**



1. An improved casket cap brace support for supporting the pivotally mounted cap of a casket body in its open position, said support comprising:
a. a support bracket adapted to be affixed to the casket body, said bracket having an aperture therethrough adapted to vertically receive a pivotal brace member;
b. an elongated slot in said casket cap positioned above said support bracket;
c. an elongated brace member extending through said aperture in said support bracket and attached thereto for pivotal movement in a vertical plane, said member extending through and slidable within said slot in said casket cap; and
d. said brace member having an enlarged section at its extended end defining a recess formed by two projections for engaging one end of said elongated slot and vertically supporting said cap in the open position, said section also defining a third projection simultaneously engaging the opposite end of said slot for camming said recess into receiving relation with said one end and for locking said cap against movement is either direction when the cap is raised to its open position.

3,959,860

METHOD OF MAKING NON-SHORTING PHOTOFLASH LAMP

Donald R. Schindler, Burton, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 20, 1974, Ser. No. 534,819
Int. Cl.² H01J *9/18*
U.S. Cl. 29—25.16 **13 Claims**

1. A method of beading and sheathing an elongated electrical conductor comprising the steps of sealing a bead of vitreous material around said conductor, providing a die having an opening therein, positioning said conductor into said opening so that said bead rests against a surface of the die, moving said conductor axially in said opening in a direction away from said bead, said opening being sufficiently greater in diameter than said conductor and said bead being sufficiently hot during said moving of the conductor so that material of said bead is drawn

only by said conductor into said opening thereby forming a sheath extending from a side of said bead and around a length

of said conductor, and removing said beaded and sheathed conductor from said die.

3,959,861

CLAMPING ARRANGEMENT FOR A CUTTING TOOL

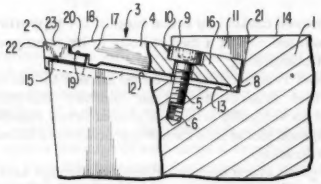
Wlajko Mihic, Tegnervagen 9, Gavle, Sweden

Continuation of Ser. No. 355,378, April 30, 1973, abandoned. This application Apr. 18, 1975, Ser. No. 569,426

Claims priority, application Sweden, Apr. 28, 1972, 5666/72

Int. Cl.² B26D *1/00*

U.S. Cl. 29—96 **2 Claims**



1. In a cut-off tool of the type wherein a narrow cutting bit having a V shaped protrusion on a bottom portion is clamped in a recess having a V shaped notch extending parallel to the longitudinal axis of the tool to engage the protrusion, at one end of a relatively narrow supporting portion extending from the upper surface of the tool holder, said supporting portion and said recess being defined by a lower wall extending inwardly and downwardly along the longitudinal axis of the tool holder at an acute angle with a plane defined by the top surface of said tool holder and a rear wall extending from said lower wall to the top surface of said tool holder approximately perpendicular to said lower wall, the improvements comprising:

a. a lever like body having a fulcrum point on one end, said fulcrum contacting said lower wall of said recess in said tool holder, and the opposite end engaging a notch in said cutting bit, said opposite end having substantially the same width as the cutting bit and said end having the fulcrum point having a greater width than said opposite end, said lever like body having a length of at least three times the width of said opposite end and is disposed in said recess such that its uppermost portion is below the upper most portion of said cutting bit and below the plane containing the upper surface of said tool holder, and

b. threaded means engaging said lever like body intermediate its fulcrum and opposite ends and threadingly engaged with said tool holder in said recess to cause said body to tend to pivot about its fulcrum point, thereby causing said opposite end to exert a normal force on said cutting bit and clamp said bit in the tool holder recess.

3,959,862

ROTARY CUTTING TOOL

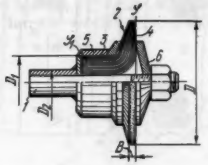
Viktor Samsonovich Salukvadze, 5 Parkovaya ulitsa, 42, kv. 53, Moscow, U.S.S.R.

Filed Aug. 5, 1975, Ser. No. 602,018

Claims priority, application U.S.S.R., Aug. 8, 1974, 2052050

Int. Cl.² B23D *71/00*; B26D *1/12*

U.S. Cl. 29—105 R **1 Claim**



1. A rotary cutting tool for working the surfaces of articles and materials, comprising: a mandrel; a plurality of resilient cutting members in the form of pieces of wire having substantially equal lengths, radially arranged on said mandrel, said resilient cutting members being secured together with their one ends adjoining which said cutting members have their side surfaces pressed to one another; the free ends of said resilient cutting members, opposite to said secured ends, defining the common cutting surface of the tool, shaped as a surface of rotation; the ratio of the sum total of the areas of the end faces of said free ends of said pieces of wire in the cutting surface of the tool to the entire area of said cutting surface being within a range from 0.10 to 0.99; a sleeve received about said mandrel; the portions of said resilient cutting members, adjoining the said secured ends thereof, being received within said sleeve; said free ends of said cutting members being bent in a radial direction and urged by a washer against the end face of said sleeve; the cutting effort at the end faces of said bent free ends of said cutting members being determined by the sum of the bending and twisting strain developed in the portions of said cutting members, the width of the cutting surface of the tool for one set of said resilient cutting members being determined from the expression:

$$B = \frac{(D_1^2 - D_2^2)\phi_1}{2D\phi},$$

where

D is the diameter of the cutting surface of the tool;

B is the width of the cutting surface of the tool;

D_1 is the external diameter of the set of said cutting members received in said sleeve;

D_2 is the internal diameter of the set of said cutting members, received in said sleeve;

ϕ is the ratio of the sum total of the areas of the end faces of the free ends of said cutting members in said cutting surface of the tool to the entire srea of said cutting surface;

ϕ_1 is the ratio of the sum total of the areas of the secured ends of said cutting members to the entire area of the internal surface of said sleeve.

3,959,863

MANUFACTURE OF AGRICULTURAL DISCS

Walter Esmond Bruce, Crown Steel Works, Sheffield, England

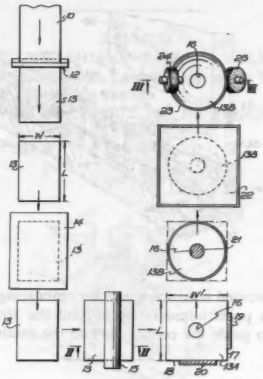
Filed Jan. 22, 1974, Ser. No. 435,539

Int. Cl.² B21K *19/00*

U.S. Cl. 29—148.3 **8 Claims**

1. A method of manufacturing agricultural discs from rolled steel strip having a thickness greater than the thickness of the finished discs and a width less than the diameter of the fin-

ished discs, comprising the steps of cutting blanks having a length substantially equal to the diameter of the finished discs, said blanks having a width less than the diameter of the finished discs, heating the blanks, rolling each blank only in the



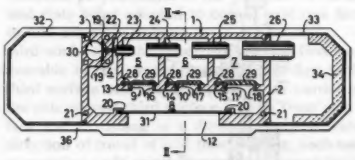
direction of its width until that dimension has increased to not less than the diameter of the finished discs, and blanking out from each rolled blank a disc with a diameter not less than the diameter of the finished discs and with a central hole.

3,959,864

METHOD FOR PRODUCING AN EJECTOR DEVICE

Peter Hans Tell, Akersberga, Sweden, assignor to Aktiebolaget Piab, Akersberga, Sweden

Filed Nov. 25, 1974, Ser. No. 526,845
Claims priority, application Sweden, Dec. 5, 1973, 7316404
Int. Cl.[2] B23P *15/00;* **F04F** *5/46, 5/22*
U.S. Cl. 29—156.4 R **7 Claims**



1. A method for producing an ejector device having a plurality of ejectors comprising,

A. forming in one step a generally tubular profile rail with
- i. a substantially planar top wall,
- ii. first and second side walls,
- iii. a bottom wall with an inlet opening along the length thereof,
- iv. an inlet channel in a corner between the top wall and the first side wall,
- v. spaced intermediate walls disposed parallel to said side walls, the intermediate walls projecting from the top wall and having respective free ends terminating a short distance from said bottom wall, and
- vi. suction openings between said free ends and the second side wall,

B. drilling holes in the formed rail along at least one straight line through said second side wall, said intermediate walls and a wall of the inlet channel,

C. inserting ejector nozzles in said drilled holes, the nozzles having respectively increasing widths progressing from the nozzle inserted in the inlet channel,

D. inserting a respective flap valve in each said suction opening, the flap valves being operable as non-return valves, and

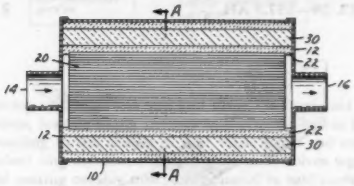
E. closing the ends of the rail by attaching an end wall to each end of the formed rail.

3,959,865

METHOD OF CONTAINING A RESILIENTLY SUPPORTED RIGID CERAMIC CATALYST SUPPORT

James R. Close, Roberts, Wis.; William P. Wood, Stillwater; Robert A. Hatch, St. Paul, and James R. Johnson, White Bear Lake, all of Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Division of Ser. No. 313,272, Dec. 8, 1972. This application Sept. 9, 1974, Ser. No. 504,297
Int. Cl.[2] F01N *3/15;* **B01J** *8/00;* **B21D** *53/00*
U.S. Cl. 29—157 R **5 Claims**



1. Process for mounting a rigid ceramic catalyst support in a metallic casing, said catalyst support and casing having different coefficients of thermal expansion, comprising,

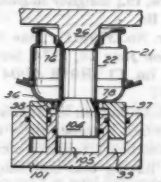
1. interposing between said support and said casing at least one ply of thermally insulating, resilient, inorganic bonded refractory fiber sheet material so that there is open space on one side thereof,
2. providing a foamable inorganic composition in said open space, and thereafter
3. effecting foaming of said inorganic composition at elevated temperatures whereby said catalyst support is securely and resiliently retained in said casing.

3,959,866

METHOD OF MAKING A GAS RANGE TOP BURNER

William P. Biddle, and John J. Tacker, both of Athens, Tenn., assignors to Athens Stove Works, Inc., Athens, Tenn.

Division of Ser. No. 498,303, Aug. 19, 1974, Pat. No. 3,922,138. This application June 6, 1975, Ser. No. 584,573
Int. Cl.[2] B21D *53/00;* **B21K** *29/00;* **B23P** *15/26*
U.S. Cl. 29—157 R **6 Claims**



1. A method of making a sheet metal burner assembly comprising the steps of providing a base plate of two joined, overlying sheet members of metal stock, said sheet members each being provided with an aligned aperture at a burner head location, portions of said sheet members forming the periphery of said apertures being spaced apart, assembling a burner head on said plate at said location by providing inner and outer shell members of uniform thin-walled metal stock, aligning one of said shell members with one of the apertures and

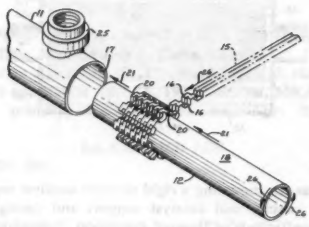
the other shell member with the other aperture, resiliently deflecting the apertured peripheral portion of a first of said sheet members relative to the second in a direction normal to the plane of the apertured peripheral portion, subsequently plastically deforming a peripheral flange of one of said shell members in a radial direction to lock said resiliently deflected apertured peripheral portion in its deflected position and to allow the stress in the resiliently deflected portion to maintain said sheets in gastight sealing engagement with their said apertures.

3,959,867

METHOD OF MAKING A HEAT EXCHANGER AND THE HEAT EXCHANGER

Donald J. Frost, Racine, Wis., assignor to Modine Manufacturing Company, Racine, Wis.

Filed Oct. 15, 1974, Ser. No. 514,475
Int. Cl.² B23P *15/26*
U.S. Cl. 29—157.3 AH **2 Claims**



1. The method of making a heat exchanger having first inner and second outer conduits spaced apart to define a fluid flow space therebetween and a turbulator in said space, comprising: arranging said conduits in separated relationship with the outer surface of said first inner conduit exposed; and winding a narrow strip of said turbulator on the outer surface of said first conduit to provide successive coils of turbulator on said outer surface while simultaneously with said winding advancing the first conduit with the coils thereon longitudinally relative to said second outer conduit into the interior of said second outer conduit, said first inner and second outer conduits thereby being telescoped with said turbulator coils within said fluid flow space.

3,959,868

TOOL AND ADAPTER FOR ELECTRICAL CONNECTOR UNIT USING INSULATION PIERCING CONTACTS

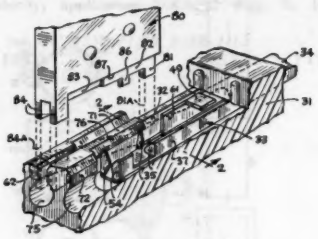
Istvan Mathe, Cicero, Ill., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Continuation of Ser. No. 370,037, June 4, 1973, abandoned. This application June 24, 1974, Ser. No. 482,547
Int. Cl.² H01R *43/04*
U.S. Cl. 29—203 DT **22 Claims**

1. A tool for mounting an insulation-covered electrical conductor in a contact member of a connector unit, the contact member including a terminal element comprising an elongated channel having one end shaped to receive the conductor and including at least one terminal flange with an outwardly open insulation piercing notch for piercing the conductor insulation to complete an electrical connection to the conductor, the connector unit including a resilient outwardly open strain relief retainer for capturing the conductor at the other end of the terminal element, the tool comprising:

a holding lug for engaging the conductor and applying a holding pressure to the conductor to maintain the conductor engaged in said one end of the terminal element channel;

an insertion blade, aligned with the holding lug, for pressing the conductor into the terminal element channel, into the insulation piercing notch of the terminal flange, and into the strain relief retainer;



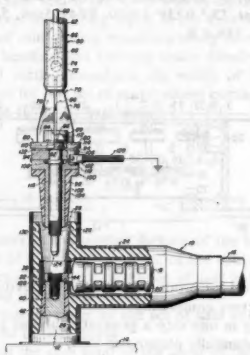
and a bifurcated insertion guide for embracing the conductor at a point immediately beyond the strain relief retainer to guide the conductor into the retainer.

3,959,869

APPARATUS FOR THE REMOTE GROUNDING, CONNECTION AND DISCONNECTION OF HIGH VOLTAGE ELECTRICAL CIRCUITS

Carl W. Wyman, Flanders, and Charles E. Andersen, Independence Township, both of N.J., assignors to Amerace Corporation, New York, N.Y.

Filed Mar. 29, 1974, Ser. No. 456,428
Int. Cl.² H01R *43/00*
U.S. Cl. 29—203 H **24 Claims**



1. Apparatus for enabling manipulation of a high voltage electrical connector from a remote location by the use of an insulated tool, such as a hot-stick, to effect connection and disconnection of the connector and the terminal of an electrical apparatus, the connector having a contact affixed to the conductor of a high voltage cable for electrically connecting the conductor to the terminal, said apparatus comprising:

a housing;

a longitudinally extending shaft journaled for rotation in the housing, said shaft having opposite ends;

engaging means at one end of the shaft for engaging the shaft with the contact of the connector in response to rotation of the shaft;

conductive grounding means;

means in the housing for electrically connecting the grounding means to the contact when the shaft is engaged with the contact; and

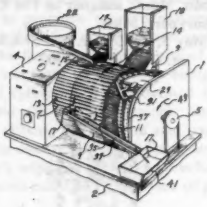
rotation means at the opposite end of the shaft for coupling the shaft for rotation with the insulated tool.

3,959,870

CONTINUOUS MOTION ASSEMBLY MACHINE

Edward I. Klein, Montreal, Canada, assignor to V-Mark Automation Ltd., Montreal, Canada

Filed Mar. 5, 1975, Ser. No. 555,638
Int. Cl.² B23P *19/04*
U.S. Cl. 29—208 R **4 Claims**



1. A continuous motion assembly apparatus for assembling devices, each said device comprising a main part and at least one further part to be assembled with said main part;

said apparatus comprising:

a first surface movable in a first direction and comprising a plurality of slots extending in a direction perpendicular to said first direction, said slots being adapted to convey said main parts to an assembly station on said apparatus, one at a time;

a second surface on one side of said first surface and movable in the same direction as said one surface, said second surface comprising a plurality of slots extending in a direction perpendicular to the direction of travel thereof, said slots being adapted to convey said one further part to said assembly station;

a third surface on the other side of said first surface and movable in the same direction as said first surface, said third surface comprising a plurality of carrier means on the side of said third surface remote from said first surface and extending in a direction perpendicular to the direction of travel of said third surface, each said carrier comprising a rod member extending perpendicular to the direction of travel of said third surface, and in the direction of said first surface;

said rod means having a direction of action perpendicular to the direction of travel of said third surface; and

cam means, acting in conjunction with said carriers and said rod means, to alter the direction of said carriers from the direction perpendicular to the direction of action of said rod means to the direction of action of said rod means by continuously variable amounts along the length of the cam means.

3,959,871

METHOD OF SELECTING REPLACEMENT VALVE STEMS

Richard L. Reback, 5649 Sorrento Drive, Long Beach, Calif. 90803

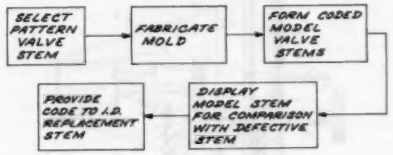
Filed Oct. 18, 1974, Ser. No. 515,917
Int. Cl.² B29C *5/00;* **B29G** *7/00*
U.S. Cl. 29—407 **5 Claims**

1. The method of making comparison models of valve stems, comprising:

screwing respective threaded ring members into ends of a plurality of threaded elongated pattern elements having shapes corresponding to various valve stem types;

placing said elements with said attached members into an open container;

successively casting curable mold-forming material in said container and about said elements and said members to form upper and lower mold halves;


SELECT PATTERN VALVE STEM
FABRICATE MOLD
FORM CODED MODEL VALVE STEMS
PROVIDE CODE TO I.D. REPLACEMENT STEM
DISPLAY MODEL STEM FOR COMPARISON WITH DEFECTIVE STEM

removing said elements and said members from said mold halves, leaving plural cavities in said mold halves corresponding to the shapes of said valve stems and said attached ring members, placing said mold halves together and casting curable moldable material in said cavities;

curing said moldable material to form a plurality of valve stem models having integral ring-like portions by which said models may be suspended and displayed; and

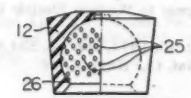
disposing each said model upon a support member of a display panel, such support member being inserted in at least one said ring.

3,959,872

METHOD FOR PRODUCING A CORE FORM TO BE EMPLOYED IN THE MOLDING OF A BALL JOINT BEARING

Michio Abe, Kasugai, Japan, assignor to Tokai TRW & Co. Limited, Kasugai, Japan

Filed Apr. 28, 1975, Ser. No. 572,529
Claims priority, application Japan, May 1, 1974, 49-49137
Int. Cl.² B22D *11/126*
U.S. Cl. 29—527.4 **5 Claims**

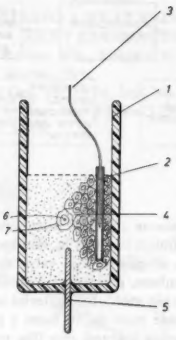


1. A method for producing a core form to be employed in the molding of a synthetic resin or rubber ball joint bearing which has a spherical bearing surface adapted to encircle the ball of a ball joint resiliently and a plurality of isolated oil retention recesses formed in said bearing surface, comprising the steps of forming and finishing a spherical portion corresponding to said bearing surface of the bearing on a core form blank, applying a lead layer onto said spherical portion, removing said lead layer from selected areas of said spherical portion which correspond to said oil retention recesses to be formed in the bearing surface of the bearing to expose said selected areas, applying a hard chrome plating layer on said exposed areas to form reliefs which are adapted to form said oil retention recesses in the bearing and removing the remaining portion of said lead layer from the spherical portion.

3,959,873
METHOD OF MANUFACTURING A SOLID ELECTROLYTIC CAPACITOR

Peter M. Hille, Nurnberg-Katzwang, Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Aug. 20, 1974, Ser. No. 498,881
Claims priority, application Germany, Aug. 31, 1973, 2344073
Int. Cl.² B01J *17/00*
U.S. Cl. 29—570 **1 Claim**

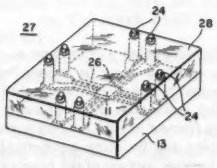


1. A method of manufacturing a solid electrolytic capacitor, comprising pouring a metal powder into a mold of insulating material having an anode lead wire sealed in one end, inserting a porous hollow tubule of insulating material into the metal powder, and heating and sintering the powder together in the mold, introducing a solution for forming a dielectric oxide layer through said tubule into said sintered powder, forming said oxide layer, removing said solution, adding a manganizing solution through said tubule into said sintered powder, forming a manganese oxide layer, inserting a cathode lead through said tubule to join said manganese oxide layer, and sealing the open end of said mold.

3,959,874
METHOD OF FORMING AN INTEGRATED CIRCUIT ASSEMBLY

Alexander Coucoulas, Bridgewater Township, Somerset County, N.J., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Dec. 20, 1974, Ser. No. 534,919
Int. Cl.² H01L *21/56*
U.S. Cl. 29—577 **54 Claims**



1. A method of forming an integrated circuit assembly, which comprises:

a. selectively treating a surface of a carrier to delineate a pattern thereon capable of receiving a metal deposit;

b. contacting said pattern with a conductive lead of an integrated circuit;

c. contacting said contacted pattern with an external conductive element;

d. depositing a metal on said pattern to form an assembly having a continuous conductive metal deposit joining said lead and said external element;

e. partially encapsulating said metal-deposited assembly with a suitable encapsulant to form an encapsulated assembly on said carrier having at least a portion of said external element exposed; and

f. removing said partially encapsulated assembly from said carrier.

3,959,875
METHOD AND FIXTURE FOR MANUFACTURING FUSES HAVING HELICALLY WOUND FUSIBLE ELEMENTS

Erwin Salzer, Waban, Mass., assignor to The Chase-Shawmut Company, Newburyport, Mass.

Filed May 5, 1975, Ser. No. 574,542
Int. Cl.² H01H *69/02*
U.S. Cl. 29—623 **10 Claims**

1. A process for manufacturing fuses for elevated circuit voltages including the steps of

a. arranging a pair of cylindrical plug terminals both having axial passageways open on both end surfaces thereof in coaxial spaced relation so that said passageways in one of said pair of plug terminals are in registry with said passageways in the other of said pair of plug terminals;

b. threading a plurality of metal rods through said passageways in said pair of plug terminals in such a way that each of said plurality of rods projects with each end thereof beyond the axially outer end surface of each of said pair of plug terminals;

c. arranging a pair of rod-clamping members having passageways in such a way that said passageways thereof are in registry with said passageways in said pair of plug terminals and that said rods project into said passageways in said pair of rod-clamping members;

d. clamping said rods against said passageways in said rod-clamping members so as to preclude relative movement between said rods and said rod-clamping members;

e. winding fusible element means substantially helically around said rods and conductively connecting the ends of said fusible element means to said pair of plug terminals;

f. sliding a tubular casing over one of said pair of clamping members into press-fitting engagement with said pair of plug terminals and affixing said casing to said pair of plug terminals;

g. filling said casing with a pulverulent arc-quenching filler through registering apertures in one of said pair of rod-clamping members and in one of said pair of plug terminals; and

h. withdrawing said rods from said fusible element means and drawing said rods out of said casing at such point of time when said arc-quenching filler provides substantial and sufficient support for said fusible element means.

4. A fixture for manufacturing fuses having helically wound fusible elements including

a. a pair of cylindrical plug terminals;

b. a pair of rod-clamping members, at least one of said pair of rod-clamping members being arranged inside of the cylindrical space defined by the lateral surfaces of said pair of plug terminals;

c. metal rods having non-screw-threaded surfaces projecting through registering passageways in said pair of plug terminals into registering passageways in said pair of rod-clamping members;

d. fasteners affixing said pair of rod-clamping members to said rods to preclude relative movement between said pair of rod-clamping members and said rods;

e. at least the fasteners affixing one of said pair of rod-clamping members to said rods being wholly arranged inside said cylindrical space defined by the lateral surfaces of said pair of plug terminals; and

f. means for affixing the other of said pair of rod-clamping members to one of said pair of plug terminals positioned immediately adjacent thereto to preclude relative movement between said one of said pair of plug terminals and said rods.

3,959,876

METHOD OF FORMING A PRINTED CIRCUIT WITH MEANS FOR PREVENTING ACCUMULATION OF METAL ALLOY

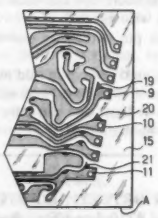
Jean-Pierre Jouanneault, Versailles, France, assignor to Compagnie Industrielle des Telecommunications Cit-Alcatel, France

Continuation of Ser. No. 425,555, Dec. 17, 1973, abandoned. This application July 14, 1975, Ser. No. 595,360

Claims priority, application France, Dec. 15, 1972, 72.44870

Int. Cl.² H05K *3/32*

U.S. Cl. 29—628 **5 Claims**



1. A method of disposing a film of metal alloy over a plurality of conductive strips disposed on at least one surface of an insulating planar support member forming a printed circuit, the method comprising forming means for preventing the accumulation of the metal alloy at selected connection points of the strips under the action of surface tension during the formation of the film, the accumulation preventing means being formed as sharp appendages of the strips, all of the appendages pointing in substantially the same direction and located proximate to the selected connection points, and applying a film of metal alloy over the conductive strips with the accumulation preventing means driving the excess metal alloy away from the selected connection points under the action of surface-tension during the formation of the film of metal alloy on the strips.

3,959,877

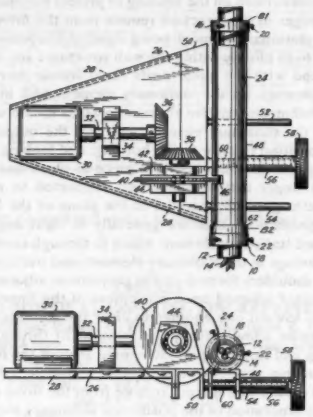
SHEATH CUTTING TOOL FOR FLEXIBLE ELECTRICAL CABLES

Peter Zorzenon, Main St., Northport, Long Island, N.Y. 11768

Continuation-in-part of Ser. No. 535,378, Jan. 3, 1975, abandoned. This application Oct. 14, 1975, Ser. No. 621,831

Int. Cl.² B21F *13/00*; B26B *27/00*

U.S. Cl. 30—90.3 **12 Claims**



1. A portable sheath cutting tool comprising two spaced means for engaging said sheath at longitudinally spaced positions and for stationarily holding said sheath in extended condition between said spaced positions, a support positioned between and rotatably attached to said two spaced means for turning about said sheath, cutting means on said support for turning therewith and effecting between said two spaced means a circumferential cut in and around said sheath, and power means on said support for driving said cutting means.

3,959,878

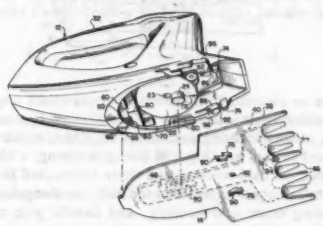
CONVERTIBLE PORTABLE ELECTRIC TOOL

Edward A. Irelan, Columbia, Mo.; David W. Dorheim, Baltimore, Md., and William Frederick Robotham, St. Charles, Ill., assignors to McGraw-Edison Company, Elgin, Ill.

Filed Apr. 2, 1975, Ser. No. 564,280

Int. Cl.² B26B *19/02*, *19/06*

U.S. Cl. 30—220 **1 Claim**



1. In a portable electric tool having a power housing and a plurality of different tool output pieces, where each output piece has a stationary element and an element supported thereby to move relative to the former effective to define a specific tool output, and where the power housing has an exposed drive element, the improvement being means for

releasably securing, without the need of any tools, any such output piece operatively to the housing so that an operable drive connection is provided between the movable element and the drive element, the combination comprising positioning means including wall structures formed on the housing at locations spaced from and generally about the drive element, ledges outstanding from certain of the wall structures in approximate right angle relations thereto and disposed generally in a common plane offset laterally from the drive element, guide posts formed on the housing to project beyond the plane of the ledges in the direction remote from the drive element, and the stationary element being sized to cooperate with the housing to fit closely within the wall structures and against the ledges and with the guide posts fitted within corresponding guide openings on the stationary element and in generally snug relationship relative thereto so as to locate and stably support the stationary element and thus the output piece in proper position relative to the housing; and locking means for retaining the so positioned tool piece in place and including opposed finger actuated elements supported to move only along paths generally parallel to the plane of the ledges and having projections that are generally at right angles to the positioned stationary element which fit through corresponding lock openings in the stationary element, and outwardly facing locking shoulders formed on the projections adjacent the free ends thereof adapted upon movement of the finger engaging elements toward one another to clear the stationary element and likewise allow thereby the same to fit through the lock openings and further upon movement then of the finger actuated elements away from one another to overlie the stationary element on the side thereof remote from the drive element to preclude separation of the positioned stationary element from the housing, and means for resiliently biasing the finger actuated elements apart.

3,959,879

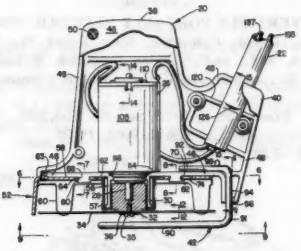
ELECTRICALLY POWERED GRASS TRIMMER

Jerry W. Sellers, Lexington, Tenn., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Division of Ser. No. 335,928, Feb. 26, 1973, Pat. No. 3,886,716. This application Dec. 6, 1974, Ser. No. 530,338

Int. Cl.[2] A01G *3/06*

U.S. Cl. 30—276 **2 Claims**



1. In an electrically powered lawn care tool, a split housing longitudinally divided into a pair of separately formed mating shells, means securing said shells together, an electric motor disposed in said housing and having a casing, a blade located exteriorly of said housing and drive connected to said motor for rotation about a pre-selected axis, an elongated handlebar extending from said housing, and handle grip means positioned on said handlebar remote from said housing, said shells having abutting bottom wall portions that define a bottom wall of said housing, said shells being integrally formed with opposed ears extending radially of the motor rotational axis and interfittingly seating against said casing on diametrically opposite side of said motor to confine said motor against lateral movement, one of said ears being formed with a lip, and said motor being axially confined between said lip and said bottom wall, and coacting means on one of said ears and said casing for preventing rotation of said casing relative to said housing.

3,959,880

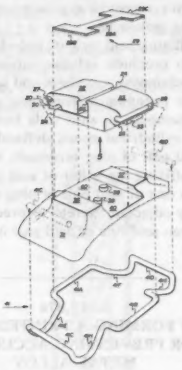
SPRING-STRESSED ORTHODONTIC BRACKET

Lawrence F. Andrews, 2025 Chatsworth Blvd., San Diego, Calif. 92107

Filed Aug. 14, 1974, Ser. No. 497,281

Int. Cl.[2] A61C *7/00*

U.S. Cl. 32—14 A **6 Claims**



1. A spring-stressed orthodontic bracket comprising:

first and second jaw members;

a base member, said first and second jaw members being coupled to and carried by said base member, at least one of said first and second jaw members being in slidable relationship with the other of said first and second jaw members;

biasing means coupled to at least one of said first and second jaw members and operable for biasing said first and second jaw members toward each other for defining at least one arch wire groove;

at least one limit pin extending outwardly from said base member; and

at least one elongated groove in said at least one of said first and second jaw members geometrically disposed for receiving said at least one pin base member for limiting relative movement thereof.

3,959,881

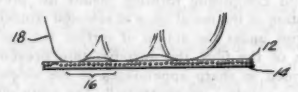
BITE INTENSITY DETECTING ARTICULATING PAPER

August Kokal, Jr., 8710 Lone Star Road, Jacksonville, Fla. 32211

Filed Apr. 25, 1975, Ser. No. 571,691

Int. Cl.[2] A61C *9/00*

U.S. Cl. 32—19 **5 Claims**



1. Apparatus for marking tooth contact points in differing colors on occlusion, comprising:

a. carrier means for insertion between the teeth;

b. a plurality of rupturable marking means randomly dispersed in said carrier means for marking said contact

points upon rupture, each of said marking means producing a different color; and

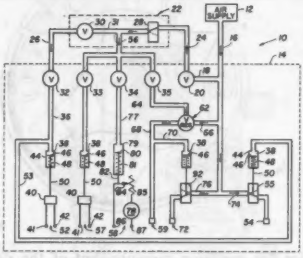
c. means for causing each of said marking means to rupture at a different biting pressure.

3,959,882

FLUID CONTROL APPARATUS

Chester B. Rackson, 22 Orchard Drive, Woodbury, N.Y. 11797

Filed June 17, 1974, Ser. No. 479,845
Int. Cl.² A61C 19/02
U.S. Cl. 32—22 9 Claims



1. In a dental apparatus for controlling a dental workpiece,

a plurality of output couplings to which dental workpieces may be selectively connected,

a source of fluid under pressure for operating the workpieces connected to said couplings,

a hand held assembly having a portable valve that is hand operated to selectively vary the flow of fluid therethrough,

flexible fluid conduit means connecting said portable valve between said output couplings and said source of fluid to enable the unrestricted movement of said portable valve,

variable valve means connected with said portable valve and between certain selected ones of said plurality of output couplings and said fluid source to variably control the flow of fluid from said source to said selected output couplings in response to the selected hand operation of said portable valve,

and operable valve means between said variable valve means and at least one of said certain selected output couplings operable in response to the operation of said portable valve to control the operation of a workpiece connected with said one output coupling.

3,959,883

HAND CONTROL SYSTEM FOR POWER HAND TOOLS

Earl L. Walls, 6567 Avenida Manana, La Jolla, Calif. 92037, and Verl O. Olson, P.O. Box 2035, La Mesa, Calif. 92041

Filed July 23, 1973, Ser. No. 381,636
Int. Cl.² A61C 1/05, 1/08
U.S. Cl. 32—27 82 Claims

1. A hand control system for power hand tools comprising:

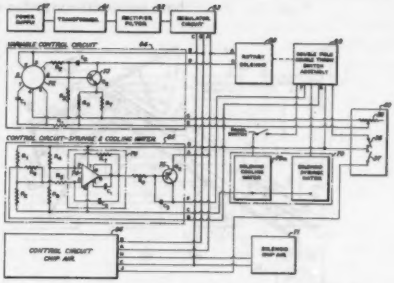
a. means for actuating an operation of the power hand tool,

b. manually operated control means for activating a low current electric command signal maintained at up to about 10 micro amps and below the necessary current flow for operating said actuating means,

c. said command signal electrically flowing through said manually operated control means,

d. circuit means separate from the manually operated control means and including amplifying means for providing a higher current operational signal to said tool operation actuating means,

e. said amplifying means being responsive to the low current electric command signal when said command signal is activated by said control means to cause said higher



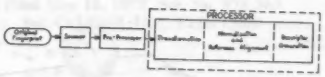
current operational signal to operate said tool actuating means.

3,959,884

METHOD OF CLASSIFYING FINGERPRINTS

Gene M. Jordan; Robert G. Eisenhardt, and Dean Z. Douthat, all of Ann Arbor, Mich., assignors to First Ann Arbor Corporation, Ann Arbor, Mich.

Filed July 25, 1975, Ser. No. 599,143
Int. Cl.² G06K 9/00
U.S. Cl. 33—1 BB 17 Claims



1. The method of classifying fingerprints comprising the steps of: making an impression of a fingerprint on a two-dimensional surface, transforming the two-dimensional surface representation of the fingerprint impression into a representation of a three-dimensional surface with a predetermined set of first and second coordinates and with a variable third coordinate for each set of first and second coordinates, the third coordinate having a value dependent upon the frequency of occurrence or ridge lines at a specific set of first and second coordinates when the origin of the first and second coordinates is taken at multiple positions over a prescribed part of the fingerprint impression, determining the values of local spatial derivatives of a plurality of different areas of the three-dimensional surface, and concatenating said values in a predetermined order to construct a descriptor code for the fingerprint.

3,959,885

TROLLING DEPTHOMETER

Glen P. Edmiston, P.O. Box 852, Alleghany, Calif. 95910

Filed Oct. 2, 1974, Ser. No. 511,423
Int. Cl.² G01B 5/18
U.S. Cl. 33—126 2 Claims

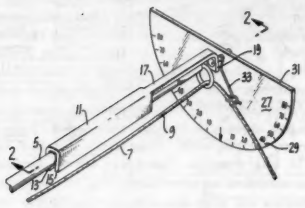
1. A depthometer and fishing pole comprising in combination:

a. a fishing pole having the usual terminal end over which the line passes,

b. a U-shaped clip adapted to snap over said fishing pole near the terminal end thereon,

c. an extension arm extending from said clip generally parallel to said pole and terminating beyond the terminal end of said pole, said arm having a fixed, downturned end with a pin in said downturned end,

d. a semicircular protractor pivoted on said pin, and



e. a line holder pivoted on said pin whereby said line holder can be snapped onto a line held by the pole and said protractor will indicate the angle at which the line extends.

3,959,886

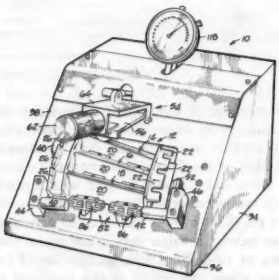
CLASSIFICATION GAUGE FOR VANE CLUSTERS

Elmer L. Griggs, 1720 Toledo, Burlingame, Calif. 94010

Filed May 8, 1975, Ser. No. 575,501

Int. Cl.² G01B *5/20*

U.S. Cl. 33—174 C **15 Claims**



8. A classification gauge for a vane cluster including an integral or composite assembly of airfoil elements and combined mounting flange means for the airfoil elements, comprising

support means,

a precision jig in said support means adapted to receive the vane cluster, the precision jig including stop means for engaging the mounting flange means in order to accurately position the vane cluster in a predetermined plane on the precision jig,

movable contact means arranged upon the classification gauge for contact with each respective airfoil element,

indicating means to visually provide a throat area classification, and

linkage means providing an averaging connection between the output of the plurality of movable contact means and said indicating means, said linkage means and averaging connection causing said indicating means to register a throat area classification depending upon the angular position and effective length of the airfoil elements within the vane cluster.

3,959,887

DEVICE FOR PRECISION MEASUREMENT OF INTERNAL DIAMETERS

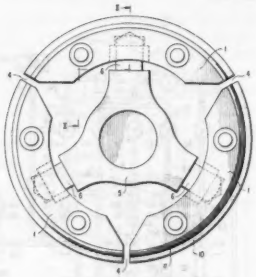
Karlheinz Seidel, Olching, Germany, assignor to Maschinenfabrik Augsburg-Nurnberg AG, Germany

Filed July 10, 1974, Ser. No. 487,134

Claims priority, application Germany, July 10, 1973, 2334962

Int. Cl.² G01B *3/46*

U.S. Cl. 33—178 R **2 Claims**



1. Device for precision measurement of the diameter of thin-walled pipes comprising:

at least three jaw segments which together form a substantially cylindrical body having an outside diameter slightly less than the nominal internal diameter of a pipe to be measured,

jaw actuating means for centrically extending said jaw segments radially outwardly to clampingly engage the internal walls of said pipe while maintaining a circular configuration of the outer surface of said jaw segments, said at least three jaw segments are formed from a single cylindrically shaped body of three symmetrically located radial slits, the diameter of said cylindrically shaped body being equal to the nominal internal diameter of the pipe to be measured

scale means connected to said jaw actuating means for accurately depicting the diametric extent of the outer surface of said jaw segments, wherein said scale means and said jaw actuating means are formed as a three-point inside micrometer with said jaw segments being detachably seated on each of the feeler points of said micrometer,

and wherein each of said jaw segments exhibit a plurality of arched outer surfaces in a stepped arrangment to accommodate measurement of pipes with a corresponding plurality of nominal inside diameter.

3,959,888

PRECISE INDEXING DETENT

Allister L. Baker, Denville, and J. Peter E. Kooi, Succasunna, both of N.J., assignors to Keuffel & Esser Company, Morristown, N.J.

Filed Mar. 3, 1975, Ser. No. 555,020

Int. Cl.² G01C *1/00*

U.S. Cl. 33—282 **2 Claims**

1. In a level-transit comprising an alidade including a telescope standard and means pivotally mounting a telescope for transit about a horizontal transverse axis, the improvement in means for arresting the transitary movement of the telescope in precise register with a fixed index, said improvement comprising:

a. a first grooved member affixed to the telescope standard to thereby establish said index location;

b. a second grooved member affixed to means mounting said telescope for transitary movement;

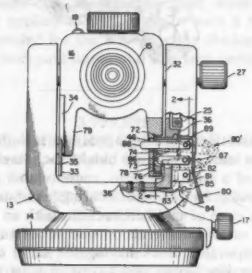
c. the respective grooves of said first and second members consisting essentially of a pair of intersecting plane surfaces;

d. said second member being situated so as to follow, during said telescope movement, a fixed path passing closely adjacent to said first member;

e. said first and second members being so oriented as to be in close juxtaposition at said index location with their respective groove faces combining to form at least a section of a quadrilateral pyramid within which section a sphere may be placed in simultaneous contact with said section faces;

f. selectably positionable toggle means pivotally mounted to one of said standard and said telescope mounting means;

g. detent means comprising an elongated element including a spherical zone surface at its distal end and being loosely



mounted by its proximal end to said toggle means for directing movement of said element along its longitudinal axis between a release mode wherein said element distal end is withdrawn from said pyramid section and an indexing mode wherein said element distal end is located within said pyramid section with said spherical surface in simultaneous contact with said section faces;

h. actuable means for urging said detent element in the direction of said distal end toward the vertex of said pyramid, thereby to effect and maintain said simultaneous contact between said spherical zone and section face surfaces, said urging means being actuated by selected positioning of said toggle means in said indexing mode; and

i. means preventing the actuation of said urging means whenever said first and second grooved members are other than juxtaposed substantially at said index location.

3,959,889

METHOD AND APPARATUS FOR DETERMINING A MEASURED DIRECTION RELATIVE TO AN EXTERNAL MAGNETIC DIRECTION

Samuel M. Thomas, 12 Beech Hill Road, Lloyd Harbor, N.Y. 11743

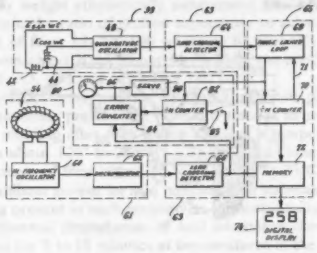
Filed Nov. 29, 1974, Ser. No. 528,428
Int. Cl.² G01C *17/30*; G01R *33/02*
U.S. Cl. 33—361 **19 Claims**

1. An apparatus for determining the orientation of an external magnetic field relative to a reference direction comprising:

means for producing a rotating magnetic field, the magnetic field vector of which bears a known angular relationship as a function of time to the reference direction; the rotating magnetic field being located to interact with the external magnetic field;

detector means, located in a stationary position relative to the rotating magnetic field to be influenced by the interacting rotating and external magnetic fields, for detecting the occurrence of a predetermined angular relationship between the rotating and external magnetic field vectors;

means for measuring the time between occurrence of the predetermined angular relationship between the rotating and external field vectors and occurrence of a preselected angular relationship between the rotating field vector and the reference direction, and



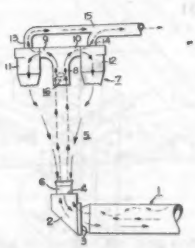
means for comparing the time between said occurrences with the period of said rotating magnetic field to determine the orientation of the external magnetic field relative to the reference direction.

3,959,890

METHOD AND APPARATUS FOR ADJUSTABLY FEEDING RAW MATERIAL TO A PREHEATER FOR A KILN

James L. Shy, East Troy, and Robert M. Bliemeister, Milwaukee, both of Wis., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed May 16, 1975, Ser. No. 578,363
Int. Cl.² F26B *3/08*; F27B *15/08*
U.S. Cl. 34—10 **5 Claims**



4. A method for feeding particulate raw material to a preheater for a rotary kiln or the like, with the preheater having a pair of gas-to-solids heat transfer devices for a first stage raw material preheating, and a gas supply conduit having a pair of gas discharge conduits therefrom for receiving gases from the kiln and conducting the gases upwardly and substantially equally to each of said first stage devices for preheating the raw material therein; said method comprising:

a. injecting a stream of raw material into the gas supply conduit along an entry axis transverse to a central axis of the supply conduit;

b. deflecting the stream of raw material within the supply conduit, along a second axis which intersects the entry axis to define an obtuse included angle; and

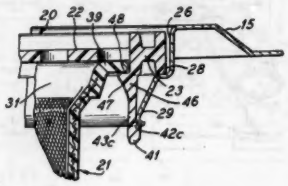
c. moving the intersection of the entry axis and the second axis along the entry axis and rotating the deflected portion of the stream around the entry axis until the temperature drop of gases passing through each of the heat transfer devices becomes substantially equal, to thereby operate the preheater with substantially balanced loading of raw material between the pair of heat transfer devices.

3,959,891

REMOVABLE LINT SCREEN ASSEMBLY FOR A DRYER

Alvin Edward Burkall, St. Joseph, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Dec. 30, 1974, Ser. No. 537,075
Int. Cl.² F27B 21/06
U.S. Cl. 34—82 10 Claims



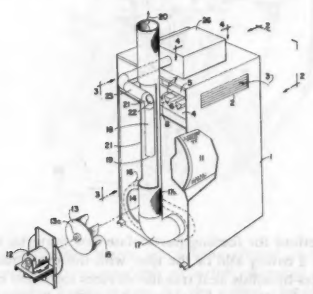
1. In an internal lint screen assembly comprising a cover and a separable lint filter for use in an automatic clothes dryer, a plurality of discrete elongate locking tabs spaced about the periphery of the cover and each having outwardly-extending projections removably securing the assembly to adjoining walls of an air exhaust aperture, at least two of said tabs being compound tabs also having inwardly-extending barbs releaseably engageable with a flange of the lint filter.

3,959,892

HEATED AIR RECYCLE ARRANGEMENT

Robert H. Cloud, Lexington, Ky., and Edward J. Hopton, Nashville, Tenn., assignors to A.M. Industries, Lousiville, Ky.

Continuation of Ser. No. 493,525, Aug. 1, 1974, abandoned.
This application June 20, 1975, Ser. No. 588,677
Int. Cl.² F26B 11/02
U.S. Cl. 34—131 7 Claims



1. A heated air recycle arrangement for use in a heated air clothes dryer including a cabinet means with air supply inlet means, and an air exhaust outlet; heater means to selectively heat air supplied through said air supply inlet means; a drying zone defined within said clothes dryer cabinet means; receptacle means disposed within said drying zone to receive clothes to be dried; blower means to pass air received from said air supply means to dry clothes received by said receptacle means and to exhaust said air stream received from said air supply inlet means from said dryer cabinet through said air exhaust outlet in a generally helical flow pattern; and exhaust conduit means communicating with said exhaust outlet wherein said recycle arrangement provides: a recycle air conduit means disposed generally concentrically within said air exhaust outlet and having an inlet with a mean diameter less than the mean diameter of said exhaust conduit means and an outlet communicating with said air supply means.

3,959,893

EDUCATIONAL GAMING APPARATUS

Theodore William Sigg, 601 S. Delphia, Park Ridge, Ill. 60068

Continuation of Ser. No. 483,221, June 26, 1974, abandoned.
This application Sept. 19, 1975, Ser. No. 614,840
Int. Cl.² G09B 19/02; A63F 9/04
U.S. Cl. 35—31 G 9 Claims

1. An educational gaming apparatus including:

a set of at least six number blocks each having the configuration of a regular hedron, each number block having at least twelve face sections bearing a numeral or its equivalent on each of said face sections with an unbiased distribution of said numerals on said set of number blocks;

a single operator block having the same configuration as said number blocks and having at least twelve face sections each bearing one or more of the basic mathematical symbols of addition, subtraction, multiplication or division or their equivalent such that at least one of said basic mathematical symbols or their equivalent is present on any uppermost face section of said operator block for any random position thereof;

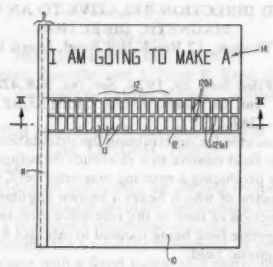
said apparatus adapted for random toss of said number blocks and said operator block by one or more players and adapted for arrangement of said blocks after said toss in an order such that uppermost face sections of selected number blocks and said operator block indicate a mathematical problem and solution.

3,959,894

PERCEPTUAL CELLS WRITING GUIDE

Christina D. Hanson, 809 Vauclain Road, Bryn Mawr, Pa. 19010, and Gail E. Duchmann, 541 Calhoun St., New Orleans, La. 70118

Filed Dec. 30, 1974, Ser. No. 537,210
Int. Cl.² G09B 21/02
U.S. Cl. 35—38 12 Claims



1. A perceptual cells guide for persons requiring manual assistance in forming messages upon paper or the like, comprising:

a. support means arranged to hold the paper in a substantially flat plane,

b. retaining means connected to said support means, and

c. a substantially rigid guide sheet retained by said retaining means adjacent the face of said paper,

said guide sheet having a thickness greater than said paper and including a plurality of substantially equally spaced and intersecting horizontal and vertical strips of substantially rigid material arranged to form a plurality of regularly and symmetrically arranged perceptual cells arranged in a group, which cells are substantially identical to each other in height, width and shape throughout the group, all of said cells being substantially rectangular in shape, extending across and up and down said sheet, said cells being aligned with one another vertically and horizontally, and each said cell having a pair of spaced apart horizontal guide edges and a pair of spaced apart vertical guide edges, whereby a writing instrument may be inserted into said cells successively, and whereby written indicia may be applied to said paper in such a manner that guidance is provided for the writer by the thicknesses of the inner edges of both said horizontal and said vertical strips.

3,959,895

POLYVINYL CHLORIDE POLYBLEND MOLDING

Thor J. G. Lonning, Suffield, Conn., assignor to Monsanto Company, St. Louis, Mo.

Filed June 27, 1974, Ser. No. 483,864

Int. Cl.[2] A43B *13/04*

U.S. Cl. 36—32 R **20 Claims**

1. A molded unitary shoe sole and heel consisting of a molding having the size and shape of a shoe sole and heel, said molding being comprised of a fused admixture of:

A. from about 50 to 80 parts of a polyvinyl chloride polymer being characterized by having an inherent viscosity of from about 0.7 to 1.5 in a 0.2 weight percent cyclohexanone solution at about 25° to 30°C., said polyvinyl chloride polymer comprising a polymer selected from the group consisting of homopolyvinyl chloride and polyvinyl chloride copolymers having up to 25 weight percent of another ethylenically unsaturated comonomer polymerizable therewith,

B. a butadiene-styrene rubbery substrate having a butadiene content of 68 to 95 percent by weight and a styrene content of 5 to 32 percent by weight based on the total weight of the butadiene-styrene rubbery substrate which rubbery substrate is further characterized as having a particle size in the range of 0.06 to 0.2 micron, a gel content in the range of from 40 to 95 percent, a swelling index in the range of from 10 to 40, and a second order transition temperature (Tg) less than −40°C.

C. a superstrate grafted onto the rubber substrate which superstrate comprises:

1. the polymerization product of a first polymerizable monomer composition comprising:

a. from 0.1 to 2 percent by weight of a nonconjugated diolefin monomer,

b. from 20 to 30 percent by weight of an ethylenically unsaturated nitrile selected from the group consisting of acrylonitrile, and mixtures of acrylonitrile and methacrylonitrile which contain up to 20 percent by weight of methacrylonitrile,

c. from 40 to 60 percent by weight of a vinylidene aromatic hydrocarbon monomer selected from the group consisting of styrene and alpha methyl styrene,

d. from 20 to 50 percent by weight of methyl methacrylate, and

2. the polymerization product of a second polymerizable monomer composition comprising from 55 to 85 percent by weight of an ethylenically unsaturated nitrile monomer selected from the group consisting of acrylonitrile and mixtures of acrylonitrile and methacrylonitrile which contains up to 20 percent by weight of methacrylonitrile based on the total weight of acrylonitrile and methacrylonitrile and from 15 to 45 percent by weight of a monovinylidene aromatic hydrocarbon monomer wherein the percent by weight is based on the total weight of the monomers in the second polymerizable monomer mixture;

wherein the grafted superstrate contains a total of at least 40 percent by weight ethylenically unsaturated nitrile monomer and wherein the ratio of grafted superstrate to substrate is in the range of from 15–200:100 wherein (B) plus (C) are present in from about 20 to 50 parts by weight, the total parts by weight of (A), (B) and (C) being 100 parts,

D. a plasticizer system for said molding, said plasticizer system being present in a sufficient amount to produce in said molding after such is heat fused at a temperature of from about 120° to 215°C., a Shore A hardness value in the range of from about 45 to 95 at about 23°C.,

E. a stabilizer system for said molding, said stabilizer system being present in such amounts as to substantially prevent the thermal degradation of said admixture during heat fusion for 5 to 15 minutes at temperatures in the range of from about 120° to 215°C., and

F. a lubricant system for said molding present in such amounts as to permit the release of said molding from a heated solid surface after said polymeric composition has been heat fused at temperatures in the range of from about 120° to 215°C.

3,959,896

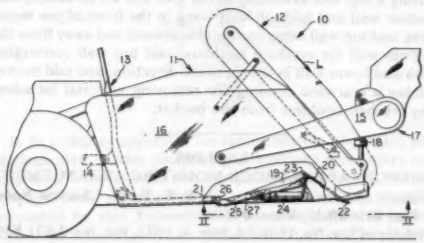
SELF-LOADING SCRAPER WITH PIVOTAL FLOOR PANEL

Ernest W. Wagner, Joliet, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Feb. 7, 1975, Ser. No. 547,908

Int. Cl.[2] E02F *1/00*; B60P *1/38*

U.S. Cl. 37—8 **11 Claims**



1. In a self-loading scraper of the type comprising a bowl having a pair of upright sidewalls and a floor extending therebetween, an elevator assembly mounted on a forward end of said bowl, and an ejector assembly normally retracted rearwardly of said bowl, the improvement wherein said floor comprises

stationary first and second panels secured between said sidewalls in longitudinally spaced relationship thereon to define an opening therebetween,

a cutting edge secured on a forward end of said first panel, and

a movable panel having a forwardly disposed first end thereof pivotally mounted on said first panel for movement to a generally upright position adjacent to said elevator assembly and a second end thereof normally disposed adjacent to a forward end of said second panel to cover said opening, and

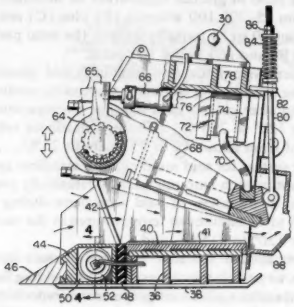
actuating means operatively interconnected between said movable panel and said bowl for selectively pivoting said movable panel forwardly and upwardly to its generally upright position adjacent to said elevator assembly and towards the forward end of said bowl to uncover said opening.

3,959,897

COMBINATION VIBRATING CUTTER HEAD AND CRUSHER

William P. May, 5601 S. Wayne Ave., Fort Wayne, Ind. 46807

Filed Dec. 9, 1974, Ser. No. 530,704
Int. Cl.² E02F 3/92
U.S. Cl. 37—58 14 Claims



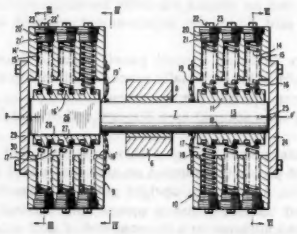
1. In an earthworking device comprising in combination, an excavatig bucket having a vibrating cutting head, said bucket having a bottom wall extending in the fore and aft direction and open on the forward end, said vibrating cutting head extending across the bottom edge of the bucket at the forward end, support means for connecting the cutting head to the bucket for vibratory movement of the cutting head with respect to the bucket, a vibrator connected to the cutting head and operable for vibrating the cutting head to facilitate penetration of the cutting head into an earth formation, said bucket having a top wall extending in the fore and aft direction, said bottom wall and said top wall being in the form of jaw members, said top wall being oscillatable toward and away from the bottom wall for crushing boulders, said top wall converging with said lower wall in the rearward direction, and said bucket having a rearward opening for removing material including any crushed boulders from the bucket.

3,959,898

DREDGE LADDER SHOCK MOUNTING ARRANGEMENT

William Andrew McWatters, c/o P. E. Terry, Charlton Road, East Brookfield, Mass. 01506

Division of Ser. No. 195,674, Nov. 4, 1971, Pat. No. 3,821,859. This application May 21, 1974, Ser. No. 471,897. The term of this patent subsequent to July 2, 1991 has been disclaimed.
Int. Cl.² F02F 3/90; F16F 9/00
U.S. Cl. 37—72 15 Claims



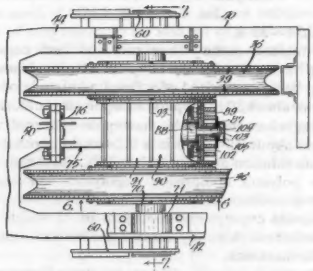
1. A shock mounting arrangement for supporting a longitudinally extending pin comprising at least one housing means surrounding a portion of the pin, said housing means including a plurality of radially extending guide chambers, and resilient means arranged in each of said guide chambers for operatively resiliently supporting the pin for limited radial movement, characterized in that the housing means includes a first and a second housing structure, said first housing structure having a first movable support block radially supported by the resilient means, said first support block having an aperture for accepting a corresponding first portion of said pin, said second housing structure having a second movable support block resiliently supported by the resilient means, said second support block having a polygon shaped aperture for accepting a corresponding second polygon shaped portion of said pin, and characterized in that said first portion of said pin has a smaller maximum radial dimension than does the second portion of said pin, whereby the first portion can be sequentially passed through the aperture of the second support block and the first support block.

3,959,899

BOOM POINT ASSEMBLY FOR AN EXCAVATING MACHINE

Krishnaswamy Rangaswamy, Forest Park, Ill., assignor to Page Engineering Company, Chicago, Ill.

Filed Aug. 8, 1974, Ser. No. 495,645
Int. Cl.² E02F 3/48
U.S. Cl. 37—116 12 Claims



1. A dragline excavating machine having a housing and a boom pivotally mounted at one end portion to said housing, a boom point assembly mounted on the other end portion of said boom and having a pair of side plates, a cross-shaft traversing the space between said pair of side plates, the end portions of said shaft being fixed in said plates, boom support lines running from said housing to said plates of said assembly, a bearing support connected to the end of the boom and to the cross-shaft and having bearing means thereon, said bearing support having an axis extending outwardly from the end of said boom, a saddle mounted on said bearing means for rotating movement about said axis of said bearing support, said saddle having a hub with an opening through which said cross-shaft extends, said opening in the hub being elongate in a vertical plane with the long axis of the opening extending vertically relative to the axis of the cross-shaft, a sheave rotatably mounted on said hub and saddle, a thrust bearing between said bearing support and said saddle for transmitting thrust loads from said saddle to said bearing support and to said boom, and a haul line running from the housing around the sheave and being connected to a bucket whereby side-to-side swing of the bucket cants the sheave, hub and saddle from side-to-side about the axis of the bearing support with said saddle rotating on said bearing means for keeping flanges on the sheave substantially in alignment with the haul line from the bucket.

3,959,900
IMPLEMENT ASSEMBLY FOR HYDRAULICALLY OPERATED EXCAVATORS

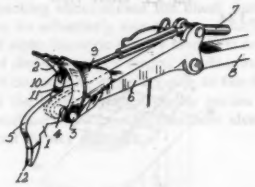
Dieter G. Luck, 147 Jacaranda Road, Kyalami, Extension 1, Transvaal, South Africa

Filed Apr. 2, 1975, Ser. No. 564,293

Claims priority, application South Africa, Apr. 3, 1974, 74/2115

Int. Cl.² E02F *3/46*

U.S. Cl. 37—117.5 **2 Claims**



1. An implement assembly for a hydraulically operated excavator including an excavator dipper arm, said assembly comprising:

a. ripper pivotally connected to the dipper arm,

b. a hydraulic operating piston and cylinder operatively connected between the dipper arm and the ripper,

c. a bucket pivotally supported on the ripper,

d. means for allowing a constrained relative longitudinal movement between the ripper and bucket,

e. said bucket having a slot through the bucket extending from the pivot towards a free end of bucker permitting passage of the ripper and its operating piston rod therethrough,

f. a hydraulic piston and cylinder means operatively connected between the excavator dipper arm and the bucket for moving the bucket between an inoperative position behind the ripper and an operating position wherein it aligns the ripper with the bucket to close the slot through the bucket.

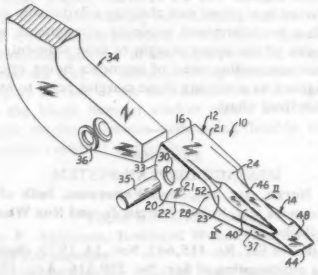
3,959,901
HIGH STRENGTH EARTH WORKING PENETRATION TOOTH

Gene Ralph Klett, Joliet, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed June 30, 1975, Ser. No. 591,593

Int. Cl.² E02F *9/28*

U.S. Cl. 37—142 R **6 Claims**



1. A unitary high strength earth working tooth, comprising, integrally formed, a proximal end for attachment to an earth working machine and a distal end for penetrating soil;

said proximal end including a generally isosceles trapezoidal upper portion, a generally isosceles trapezoidal lower portion, and a pair of generally isosceles trapezoidal sides, each side extending from an edge of said upper portion to an edge of said lower portion, a closure interconnecting the shorter bases of said upper portion, said lower portion and said two sides, and a pair of aligned holes, one through each of said sides generally on the bisecting axis thereof;

said distal end including a generally flat isosceles trapezoidal member extending at an obtuse angle from said lower portion with the longer base of said member coextensive with the shorter base of said lower portion, said member extending generally parallel to a plane defined by the bisecting axes of said sides;

said tooth including a generally right triangularly shaped ridge upraised perpendicularly from the bisecting axis of said trapezoidal member and terminating at an acute angle short of the shorter base thereof, which shorter base comprises a soil penetrating portion of said distal end, the hypotenuse of said ridge extending from said acute angle towards and terminating at a point adjacent said closure, said ridge supportedly extending from said closure.

3,959,902
DISPLAY APPARATUS

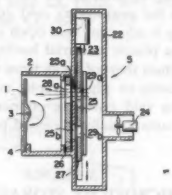
Kooji Suzuki, Tokyo, Japan, assignor to Dai Nippon Insatsu Kabushiki Kaisha, Tokyo, Japan

Filed July 19, 1974, Ser. No. 490,194

Claims priority, application Japan, July 30, 1973, 48-84864; Oct. 24, 1973, 48-118983

Int. Cl.² G09F *11/00*

U.S. Cl. 40—28 R **13 Claims**



8. In a display apparatus for representation of graphic and alphanumeric matter comprising at least one elementary display unit, wherein each unit comprises a framework, an elementary plate member having an axis and being pivotally supported by said framework so as to be rotatable in two directions around said axis when a force is applied to said plate member at a predetermined location, said plate member having two opposed face sections, stop means on said framework for arresting the rotary motion of said elementary plate member about said axis upon completion of substantially 180° rotation in either of said two directions, and pneumatic actuating means disposed adjacent one of said face sections for selectively delivering a forced current of air against said plate member to cause the rotary motion thereof in either of said two directions;

the improvement wherein said pneumatic actuating means comprises air supply means having first and second air supply openings for delivering air against said elementary plate member, a slide valve disposed adjacent said air supply openings and movable transversely to said forced current of air between first and second operative positions and having a pair of spaced apart first and second ports therethrough, said first port coinciding with said first opening when said slide valve is in said first operative position and said second port coinciding with said second opening when said slide valve is in said second operative position, and valve means movable between first and second positions for concurrently opening and closing each of said air supply openings such that when said valve means is in said first position, said forced current is permitted to exit from said first port, and when said valve

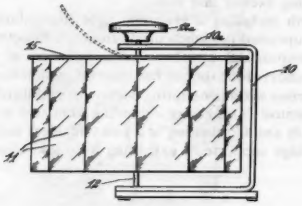
means is in said second position, said forced current of air is permitted to exit from said second port.

3,959,903

PROTECTORS FOR ROTARY DISPLAY STANDS

Aaron H. Shneider, 2835 N. Western Ave., Chicago, Ill. 60618

Filed Feb. 28, 1975, Ser. No. 553,925
Int. Cl.² G09F 11/02
U.S. Cl. 40—68.6 1 Claim



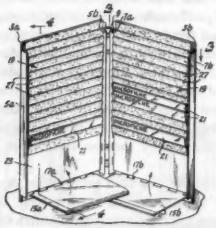
1. In a stand for displaying a plurality of record cards or photographs inserted into flat, rectangular card-receiving pockets having at least one transparent surface, which pockets are mounted on a spindle rotatable in said stand, each of said pockets having one open side for said insertions, said open sides being perpendicular to said spindle, the improvement comprising a flat, circular cover for said open sides of said pockets, means for positioning said cover onto said spindle and maintaining it adjacent said open sides, said cover being of a transparent plastic material having flexibility to permit deflecting a portion thereof away from said open sides so that one or more cards or photographs may be inserted or removed, whereby said cover in cooperation with said open sides results in substantially enclosed pockets.

3,959,904

MICROFICHE STORAGE UNIT

Robert G. Holliday, Ann Arbor, Mich., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 4, 1974, Ser. No. 520,652
Int. Cl.² G09F 11/06
U.S. Cl. 40—102 8 Claims



1. A storage unit for microfiche which unit comprises, in combination:

A. a pair of covers hingedly secured together for opening into a common plane formed by adjacent surfaces of the covers;

B. A plurality of terraced pockets having upper exposed edges secured to the adjacent surfaces of the covers forming the common plane for receiving and storing microfiche; and

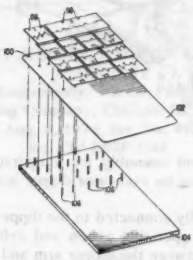
C. cleaning means secured to the exposed edges of the terraced pockets for wiping contact with both sides of a microfiche simultaneously as it is inserted into and removed from any of the pockets.

3,959,905

APPARATUS FOR MOUNTING TAPE CONTAINING RECORDED INFORMATION

Arthur K. Thatcher, Box 392, Merritt Island, Fla. 32952

Division of Ser. No. 462,500, April 4, 1974, which is a division of Ser. No. 348,749, April 6, 1973, abandoned. This application Jan. 22, 1975, Ser. No. 543,122
Int. Cl.² G09F 1/00
U.S. Cl. 40—124 7 Claims



7. Apparatus for mounting of segments of tape having information of significance thereon, of a nature such as ECG tapes and the like, in a manner providing for a maximum correlated display for interpretation of such significant information within a minimum amount of space on a single standardized mounting chart, and wherein the tape segments are selected and severed from an unedited tape of standard width, and having lengths in accordance with a predetermined set of prescribed dimensions, and with the upper margins of said tape segments being free from significantly informational recorded data to be interpreted, with the tape segments being each respectively of sufficient length to allow collectively for the full display of the information to be displayed for interpretation, and with at least one of the segment lengths being sufficiently long to permit identification of a particular identifying characteristic of the information to be displayed, the apparatus including a standardized base display chart for the type of information to be displayed and including multiple segment alignment and positional placement means, indicating appropriate areas for positional mounting of each respective tape segment with the information thereon, said segment alignment and placement means being used for facilitating arranging the segments in a plurality of successive laterally extending rows in segment end abutting relationship in accordance with a predetermined grouping arrangment, with the data free area of the upper margin of tape segments in each of the lower succeeding rows of segments being operatively visually negated by removing these margins prior to mounting on a standardized chart.

3,959,906

MESSAGE DISPLAY SYSTEM

J. Robert Norris, Jr., and Noa Wasserman, both of Dallas, Tex., assignors to J. Robert Norris, Jr. and Noa Wasserman, both of Dallas, Tex.

Continuation of Ser. No. 415,642, Nov. 14, 1973, abandoned, which is a continuation of Ser. No. 279,516, Aug. 10, 1972, abandoned. This application June 9, 1975, Ser. No. 585,296
Int. Cl.² G09F 3/10, 7/12
U.S. Cl. 40—125 A 1 Claim

1. A message display system comprising:

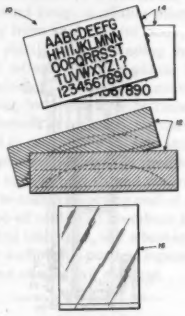
blank bumper sticker means including a front display surface having a predetermined area and a predetermined color and a back surface;

an adhesive layer extending over the entire back surface of the blank bumper sticker means;

said front display surface of the blank bumper sticker means comprising reference indicia including at least two spaced apart, longitudinally extending lines for parallel message display and at least one arcuate line overlapping the longitudinal lines for arcuate message display;

first backing sheet means substantially equal in size to the blank bumper sticker means and normally covering the back surface of the blank bumper sticker means and the adhesive layer formed thereon whereby upon removal of the first backing sheet means the blank bumper sticker means may be adhesively mounted on a surface;

a plurality of alpha/numeric display members each comprising a front display surface having a substantially smaller area and a contrasting color relative to the front display surface of the blank bumper sticker means and a back adhesive surface of a shape substantially identical to that of said front display surface;



said reference indicia on the front display surface of the back bumper sticker means being substantially smaller in size than the alpha/numeric display members so as to be substantially indistinguishable from the front display surface when observed from a substantial distance; and

second backing sheet means normally extending over the back surfaces of all of the alpha/numeric display members and the adhesive layers formed thereon and thereby normally supporting the alpha/numeric display members whereby upon removal from the second backing sheet means the alpha/numeric display members may be selectively mounted on the front display surface of the blank bumper sticker means to form a desired message;

the front display surfaces of the alpha/numeric display indicia members being substantially smaller in area than the front display surface of the sheet means so that a substantial number of the alpha/numeric display indicia members may be simultaneously mounted on the front display surface of the sheet means to form the message;

both the blank bumper sticker means and the alpha/numeric display members comprising flexible, substantially weather-resistant materials.

3,959,907

FILM RECORD CARD

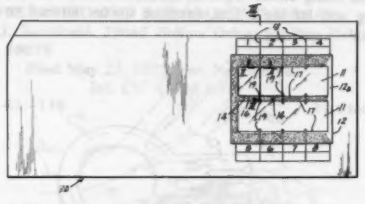
Thomas P. Anderson, Hubbard Woods, Ill., assignor to Microseal Corporation

Continuation of Ser. No. 866,344, Oct. 14, 1969, abandoned. This application Dec. 9, 1971, Ser. No. 206,323

Int. Cl.² G09F *1/10*

U.S. Cl. 40—159 **7 Claims**

1. A film record card comprising a card means having at least a transparent portion with at least one generally elongated pocket means therein adapted to receive therein a film means including a plurality of frames of generally uniform width, said pocket means having generally parallel side edge portions and being of a length to receive a plurality of film means, and a plurality of discrete masses of non-setting adhesive means in said pocket means along at least one of said side edge portions spaced apart a distance generally conforming to said width of said film frames whereby said adhesive means



will act to locate the juncture areas between said film means and frames, said adhesive means extending inwardly of said pocket from a respective side edge portion for grippingly engaging said film means to restrain movement thereof and retain the engaged film means at a selected predetermined position within said pocket means.

3,959,908

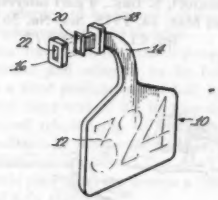
LIVESTOCK IDENTIFICATION TAG

Robert R. Lowe, P.O. Box 518, Nanton, Alberta, Canada (T0L 1R0)

Continuation of Ser. No. 467,337, May 6, 1974, abandoned. This application May 23, 1975, Ser. No. 580,445

Int. Cl.² G09F *3/00*

U.S. Cl. 40—301 **2 Claims**



1. A livestock identification tag, comprising a planar member having a body and a curved neck extending outwardly from said body and terminating in a terminal end, the neck including a first shoulder member normal to said planar member and spaced from said terminal end and a second shoulder member normal to said planar member and of lesser dimensions than said first shoulder member located adjacent the neck terminal end, and an apertured tab member adapted to be force fitted over the said second shoulder member to lock about the tag neck.

3,959,909

KELLY'S EYE COMPONENT FOR A FISHING TRAWL

Anthony Alan Buschini, Fleetwood, and Douglas Edward Swarsbrick, Stourport-on-Severn, both of England, assignors to Parsons Controls Limited, Stourport-on-Severn, England

Filed Aug. 19, 1974, Ser. No. 498,765

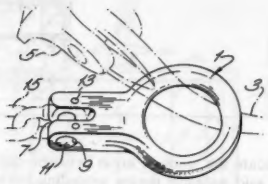
Claims priority, application United Kingdom, Aug. 24, 1973, 40206/73

Int. Cl.² A01K *73/02*

U.S. Cl. 43—8 **2 Claims**

1. A Kelly's Eye component for use with trawling gear, the said component comprising a unitary metallic member, one end of which is in the form of a ring, the ring defining an aperture which is sufficiently large to allow passage of a trawl

rope, the cross-section of the ring, within the ring, being arcuate on a radius greater than one-half the ring thickness transversely to the general plane of the ring, the other end of said metallic member being slotted to provide two arms and to resemble a clevis, said metallic member being substantially flat with its two said ends being in the same plane, said two arms being closer together than the inside diameter of said ring and having a first aperture means normal to the slot



between said arms, at least one of said arms having a further aperture extending at right angles to the said first aperture means and being arranged tangential thereto, a connecting pin in said first aperture means spanning said slot and having a tangential slot in its outer surface, and a locking pin engaged in said further aperture and in said tangential slot in the connecting pin, said connecting pin being adapted to receive a link of a chain to thereby connect said chain to said other end of the member.

3,959,910

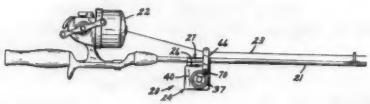
FISHING SIGNAL DEVICE

Theodore Montgomery, Frankfort, S. Dak., assignor to Wayne T. Wise, Frankfort, S. Dak., a part interest

Filed Mar. 24, 1975, Ser. No. 561,549

Int. Cl.[2] A01K 97/12

U.S. Cl. 43—17 **7 Claims**



1. A fisherman's accessory comprising, in combination:

a housing;

means for removably mounting said housing on cylindrical members of different diameters, including a pair of spaced, reslient arms having pairs of aligned, cylindrical concavities with different radii of curvature and parallel axes;

a threaded bore in said housing extending orthogonally to the axes of said concavities;

a shaft threadedly engaging said bore in said housing, so that rotation of said shaft causes axial movement thereof;

a drum fixed to said shaft within said housing, having a cylindrical surface of which a first peripheral portion is electrically conductive and a second peripheral portion is electrically non-conductive;

electrically conductive contact means carried by said housing for engaging said surface;

a source of electrical energy, electrical signal means, and means completing a series electrical circuit including said source, said signal means, said contact means, and the electrically conductive surface of said drum, so that when the latter rotates to a position in which its electrically conductive surface engages said contact means, the circuit is completed and the signal means is operated;

a crank arm fixed to said shaft outside said housing at a location on said shaft spaced from said housing, so that rotation of said crank arm about the axis of said shaft causes rotation of said shaft and said drum;

compression spring means carried on said shaft between said housing and said crank arm and frictionally engaging the same at its respective ends, so that rotation of said shaft compresses or releases said spring to vary the frictional opposition exerted thereby against rotation of said crank arm;

and releasable line engaging means carried by said crank arm, so that force acting on the line is enabled to cause rotation of said arm.

3,959,911

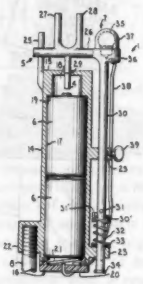
LIGHT AND SIGNAL DEVICE

Ronnie R. Puckett, R.R. 2, Hamilton, Mo. 64644

Filed July 7, 1975, Ser. No. 593,634

Int. Cl.[2] A01K 97/10, 97/12

U.S. Cl. 43—17 **8 Claims**



1. A fishing signal device comprising:

a. a housing having a side wall and opposite ends and a chamber therein;

b. said side wall of said housing has guide means extending therefrom;

c. a battery in the chamber in said housing;

d. a fishing rod holder mounted on said housing and movable toward and away from said housing, said fishing rod holder being adapted to support one end portion of a fishing rod thereon, said fishing rod holder having an electrical contact member movable therewith and into position making circuit with said battery in response to a force on the one end portion of the fishing rod;

e. said fishing rod holder is a generally L-shaped member having a first portion positioned in overlying relation with one of the opposite ends of said housing and a second portion positioned adjacent the side wall of said housing and extending through said guide means on said side wall of said housing;

f. said fishing rod holder has an abutment member thereon;

g. a signal member in electrical contact with said fishing rod holder and electrically connected to said battery;

h. resilient means positioned between and in engagement with said housing and said fishing rod holder for resiliently supporting said contact member in a circuit interrupting position with said battery until moved into position making circuit with said battery in response to a force on the one end of the fishing rod;

i. said resilient means is a coil spring having one end thereof in engagement with said abutment member and the other end thereof in engagement with said guide means; and

j. one of said abutment member and the one end of said resilient means is adjustable to selectively vary the force required to move said contact member into circuit making contact with said battery.

3,959,912

FISHING LURE

David C. Lee, Hot Springs, Ark., assignor to Charles D. Morehead, Paducah, Ky.

Filed Aug. 20, 1975, Ser. No. 606,096
Int. Cl.² A01K 85/00
U.S. Cl. 43—42.02 7 Claims

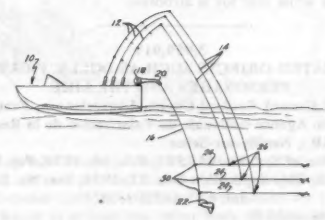
1. A lure for attachment to a fish hook, which comprises a pliable plastic central body, a pliable plastic skirt means extending outwardly from said central body, and a plurality of soft thin flexible plastic tails extending integrally from said skirt means, each of said flexible plastic tails comprising a substantially flat element having a connecting end and a free end, said connecting end being attached integrally to said skirt means, said flat element in repose being curled in a plane from its connecting end to said free end, said skirt means comprising a plurality of pliable plastic skirt members each of which is attached at one end thereof to said central body and at the other end thereof to said connecting end of one of said flat tail elements, and each of said skirt members being substantially thicker than said tail elements, and wherein said other end of said skirt member includes a portion tapered to terminate in said connecting end of said tail element.

3,959,913

RELEASABLE NON-SLIP ATTACHMENT MEANS FOR CONNECTING FISHING LINES TO DOWN-RIGGER CABLES

Claude J. Weber, 17332 Coles Park, Spring Lake, Mich. 49456

Filed Aug. 7, 1975, Ser. No. 602,568
Int. Cl.² A01K 91/00
U.S. Cl. 43—43.12 26 Claims



1. Apparatus for releasably and detachably securing a fishing line to a weighted depth-setting downrigger line, comprising:

an elongated body defining guide surfaces for a movable plunger and establishing an axis for plunger movement, said body also defining indexing surfaces for seating said downrigger line transversely of said guide surfaces;

tether line means for attaching a fishing line to said body;

a movable plunger carried with said body and disposed for movement along said guide surfaces, said plunger having a head portion for engaging said downrigger line and entrapping same upon said indexing surfaces;

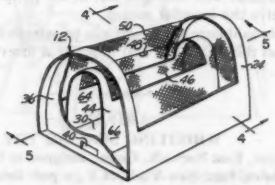
means for urging said plunger into entrapping engagement with said line and for maintaining the plunger in such engagement to thereby attach said body to said downrigger line; and manually-operable means for releasing said plunger from its line-entrapping engagement to thereby enable release of said body from the downrigger line.

3,959,914

PREFABRICATED DISPOSABLE FLY TRAP

Robert J. Kaveloski, 39663 Balboa Drive, Sterling Heights, Mich. 48078

Filed May 23, 1975, Ser. No. 580,481
Int. Cl.² A01M 1/10
U.S. Cl. 43—118 10 Claims



1. A prefabricated blank adapted to be folded into a disposable fly trap, said blank comprising

- an elongated approximately T-shaped member of flexible sheet material including
  - a longitudinal end panel adapted to be folded at a first predetermined fold location into an arch-shaped inner wall of the fly trap and thereby to define an inner fly trap chamber,
  - a bridge portion disposed adjacent said longitudinal end panel and adapted to be folded relatively thereto at a second predetermined fold location,
  - a longitudinal intermediate panel disposed adjacent said bridge portion and adapted to be folded relatively thereto at a third predetermined fold location into an arch-shaped outer wall of the fly trap disposed in outwardly-spaced relationship to the arch-shaped inner wall thereof and to define therebetween an outer fly trap chamber,
    - each of said panels having therein a light-transmitting area and a fly restrainer,
    - said longitudinal end panel having a fly exit port therein adapted in the arch-shaped folded positions of said panels to lead from the inner chamber to the outer chamber,
- and a transverse end panel disposed adjacent said longitudinal intermediate panel and adapted to be folded relatively thereto at a fourth predetermined fold location into a floor wall of the fly trap,
  - said transverse end panel having at its opposite ends arch-shaped wings adapted to be folded upward into end-closing relationship with the opposite ends of the inner and outer arch-shaped walls,
    - one of said wings having a fly entrance doorway therein adapted in the folded condition of the blank to lead from the exterior of the trap into the outer chamber thereof.

3,959,915

PROPELLED DISK COPTER TOY

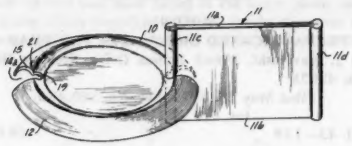
John S. Kettlestrings, 434 Carriage Drive 3-B, West Chicago, Ill. 60185

Filed Jan. 16, 1975, Ser. No. 541,511
Int. Cl.² A63H 27/14
U.S. Cl. 46—74 D 16 Claims

1. A toy comprising:

a. an impeller means having a flat resilient elongated body, said body having a center portion having a substantially

rectangular cross-sectional configuration, and end portions being enlarged protrusions respectively, the intersection of said protrusion and said center portion defining an offset, and



b. a circular disk having a slot in the periphery thereof to receive the impeller means,

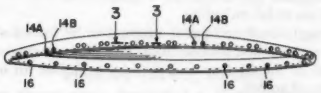
wherein said impeller means can be selectively deformed to impel the disk when said impeller is inserted in said disk slot.

3,959,916

WHISTLING SCALING TOY

Paul Meyer, East Norwalk, Conn., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Oct. 17, 1974, Ser. No. 515,476
Int. Cl.² A63H *33/18*
U.S. Cl. 46—74 D 3 Claims



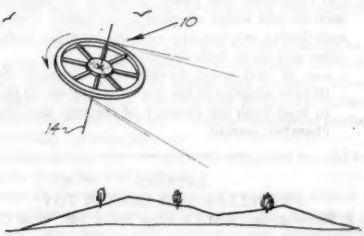
1. A scaling toy comprising: a generally circular disc having a flange depending generally perpendicularly about the periphery of said disc, and plural sound generation passageways extending generally radially through said flange in angularly spaced apart relationship, each of said passageways being generally of Y-shape communicating between a pair of angularly spaced apart openings on an outer side of said flange and an opening on an inner side of said flange.

3,959,917

FLYING TOY

Stanford Dawson, Brooklyn, N.Y., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Aug. 20, 1975, Ser. No. 606,219
Int. Cl.² A63H *27/00*
U.S. Cl. 46—74 D 3 Claims



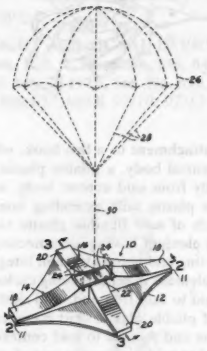
1. A flying toy comprising a generally circular air inflatable envelope for storing pressurized air, said envelope having a central geometric axis about which said envelope is adapted to spin, and jet means communicating from the interior to the exterior of said envelope for applying a lifting force to said envelope upon exhaust of air from the interior of said envelope therethrough.

3,959,918

AIRBORNE TOY

Nilson Ortiz, San Francisco, Calif., assignor to Niltec Corporation, San Francisco, Calif.

Filed Nov. 7, 1974, Ser. No. 521,824
Int. Cl.² A63H *33/20*
U.S. Cl. 46—86 R 1 Claim



1. In an aerial toy in combination with a collapsible toy parachute having shroud lines secured to the toy, the improvement comprising:

a flat base having opposing end portions forming handles adapted for use in throwing said base into the air;

a longitudinal rib extending between said end portions and secured to said base;

a transverse rib intersecting said longitudinal rib,

said ribs each having a thickened portion at their point of intersection,

said longitudinal rib having a recess in its thickened portion forming a well for nesting said parachute when in a collapsed condition; and,

a normally closed flap door loosely connected with one of said ribs for opening the well and releasing said toy parachute while said toy is airborne.

3,959,919

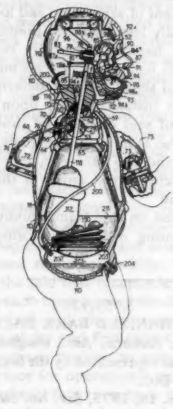
ANIMATED OBJECTS SUCH AS DOLLS, FIGURED PERSONAGES AND THE LIKE

Raymond Gerard Baulard-Cogan, Louveciennes, France, assignor to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly-sur-Seine

Division of Ser. No. 443,505, Feb. 19, 1974, Pat. No. 3,881,275. This application Dec. 23, 1974, Ser. No. 535,665
Int. Cl.² A63H *13/02*
U.S. Cl. 46—135 R 4 Claims

1. An animated doll comprisng a body including first and second hollow casings formed of substantially rigid, nondeformable material respectively generally defining head and trunk portions of the doll and an envelope of deformable flexible material fitted over said hollow casings and defining a lower jaw and mouth of the doll, an actuating member for the mouth of the doll comprising a lever mounted in said head portion of said first casing one end of which is connected in the deformable flexible part of said envelope forming said lower jaw of said doll, and actuating means operatively connected to the other end of said lever for moving said lever and thereby the mouth of the doll and simultaneously other movable parts of the doll, said actuating means comprising a rod mounted slidably and rotatably between said head and trunk portions within said first and second casings and a movable

ponderable ball-like member mounted for movement inside the hollow space of said trunk portion, said ball-like member being mounted as a counterweight at one end of said rod, the



end of said rod which moves within said head portion being connected to said lever for moving said mouth upon movement of said rod by said ponderable ball-like member.

3,959,920

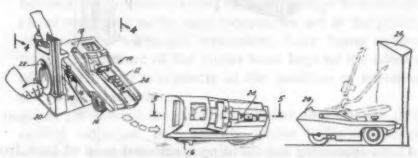
BREAKAWAY STUNT CAR

Michael Ieda, Fort Solanga, Long Island City, N.Y., assignor to Ideal Toy Corporation, Hollis, N.Y.

Filed Jan. 8, 1975, Ser. No. 539,369

Int. Cl.[2] A63H *17/02, 29/20*

U.S. Cl. 46—201 **19 Claims**



1. A toy vehicle comprising a chassis and a body removably mounted on said chassis, said body including a plurality of body elements each of which includes means for releasably connecting it to at least one other body element; and means on the vehicle responsive to an impact therewith for propelling one of said body elements away from said vehicle; said body elements being positioned in superimposed relation to one another with said one body element being positioned on top of the other body element in the assembled condition of the vehicle; said impact responsive means including releasable latch means for engaging said one body element and maintaining it in assembled relation to the other body elements; whereby said other body elements are held in assembled relation between the chassis and said one body element and propulsion of said one body element will cause a sequential break away of the body elements from the chassis as said one body element draws with it the body element to which it is connected and each body element then successively draws with it the body element to which it is connected.

3,959,921

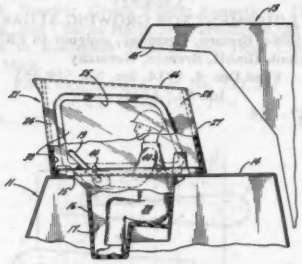
TOY VEHICLE WITH OPERATOR-SIMULATING DOLL

Bernard C. Klint, Rockford, Ill., assignor to Nylint Corporation, Rockford, Ill.

Filed Dec. 4, 1974, Ser. No. 529,386

Int. Cl.[2] A63H *11/10*

U.S. Cl. 46—202 **5 Claims**



1. A toy vehicle having a cab with a generally horizontal top, a cavity opening upwardly from the top of said cab and defining a sunken operator's compartment, an operator-simulating doll seated removably in said compartment with its head extending upwardly beyond the top of said cab, a box-like cupola normally disposed in a closed position covering said compartment and enclosing said doll, the sides of said cupola having windows rigidly carried by the cupola to permit said doll to be seen from outside of the cupola, and a generally horizontal hinge between one lower edge of said cupola and the top of said cab and mounting said cupola for bodily swinging through approximately ninety degrees to an open position uncovering said doll and said compartment to enable the doll to be removed from the compartment.

3,959,922

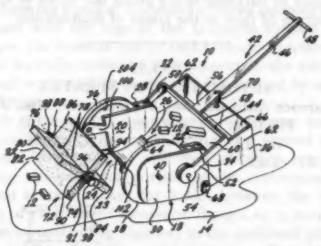
PUSH TOY ADAPTED TO PICK UP THREE-DIMENSIONAL OBJECTS LYING ON A SUPPORTING SURFACE

Gerard K. Leistikow, San Pedro, Calif., assignor to Mattel, Inc., Hawthorne, Calif.

Filed May 16, 1975, Ser. No. 578,285

Int. Cl.[2] A63H *33/30*

U.S. Cl. 46—205 **4 Claims**



1. In a push toy adapted to pick up three-dimensional objects lying on a supporting surface and having means for receiving said objects after they have been picked up, means for propelling said objects into said receiving means, said propelling means being aligned with said receiving means, means for positioning said propelling means over said objects, and means connected to said propelling means for moving it into engagement with said objects with a propelling force, the improvement wherein said propelling means comprises an impeller consisting of unitary structure made only of soft, spongy mate-

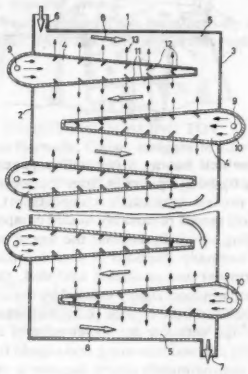
rial, said structure having first and second ends, said means for moving said propelling means including a respective attachment member connected to each of said ends as the only means directly connected to said impeller for moving it, whereby the need for a center shaft for said impeller is eliminated.

3,959,923

EQUIPMENT FOR GROWING ALGAE

Winfried Selke, Bremen, Germany, assignor to ERNO Raumfahrttechnik GmbH, Bremen, Germany

Filed Dec. 4, 1974, Ser. No. 529,453
Int. Cl.² A01G *33/00*
U.S. Cl. 47—1.4 **10 Claims**



1. Equipment for growing algae comprising, first means defining a flow duct for water containing algae and nutriants for promoting growth of the algae;

second means for establishing in the flow duct distinct zones of photochemically effective illumination alternating with zones of darkness in the flow duct, along and in the direction of flow, so that the water and growing algae therein pass through these zones in corresponding alternating sequence;

said zones of illumination being established from opposite sides of the flow duct in a significant portion of the flow duct; and

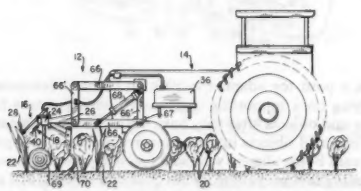
the zones of darkness being about ten times as long in the direction of flow as the zones of illumination.

3,959,924

AUTOMATIC SPOT SPRAYER

John Clarence Allen, Jr., Box 87, Indianola, Miss. 38751

Filed Oct. 24, 1974, Ser. No. 517,405
Int. Cl.² A01B *41/00*; A01G *13/00*
U.S. Cl. 47—1.43 **7 Claims**



1. Apparatus for treating individual plants growing in a row of crops, said plants being at least of a certain predetermined height comprising:

a frame movable relative to said plants;

selectively actuatable means mounted on said frame for dispensing treatment material on a plant upon being actuated by an electrical signal and for terminating the dispensing of treatment material upon termination of the signal;

sensor means mounted on said frame comprising an elongate probe arm disposed substantially parallel to the ground and extending transversely to the direction of intended movement of said frame and located at a height equal to or slightly less than said predetermined height, said probe arm having electrically conductive means disposed along its length, and circuit means for generating said electrical signal for a predetermined time duration substantially instantaneously upon said probe arm contacting one of said plants, said time duration being sufficiently long so as to insure adequate treatment of the contacted plant and also having an upper limit to prevent effective treatment of the crops in the vicinity of the treated plant; and

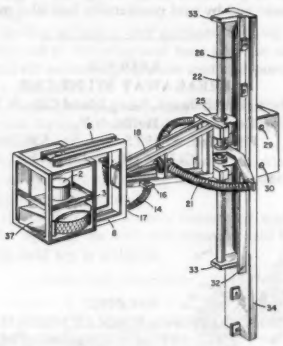
a container mounted on said frame fluidly communicating with said dispensing means for storing said treatment material.

3,959,925

MECHANIZED BARK HACK

Donald W. Sanders, Auburn, Ala., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Apr. 18, 1975, Ser. No. 569,530
Int. Cl.² A01G *23/10*
U.S. Cl. 47—12 **10 Claims**



1. An apparatus for abrading a selected area of bark from the trunk of a vital tree; said apparatus adapted to be mounted and operationally transported aboard a mobile, speed and direction controllable prime mover and said apparatus consisting of the integrated components recited infra in ordered sequence from the prime mover proximal principal apparatus support to the tree proximal, bark abrading, rotary cutter head:

principal apparatus support comprising a vertically disposed boom in the form of a rigid, unobstructed rod member of preselected length and with a journaled surface, said rod member secured top and bottom to one side of a prime mover about at the abeam location;

oscillatory horizontal boom with inboard end attached to the said vertical boom rod member via dual function slip and rotary bearings, the thus suspended horizontal boom afforded a horizontal oscillatory freedom of about ninety degrees abaft a normal abeam position relative the prime mover together with a vertical positioning capability within and journaled unobstructed andjournaled limits of the vertical boom rod member, said horizontal boom

comprising a first yoke and a second yoke, paired with the closed faces of the yokes opposed and attached through a journal and bearing pivot link, said pivot link adapted to afford relative pivotal rotation of the yokes within the approximate limits of ninety degrees to either side of a normal vertically parallel position of the paired and pivot linked yokes, the said first yoke proximal the vertical boom provided with two coaxial bearings, one each on either yoke arm end, the said bearings horizontally disposed with vertically coaxial bores journaled to the vertical boom rod member as recited above, the said second yoke provided with paired coaxial counterposed pivot bearings, one each on either yoke arm end, and carrying therebetween, journaled rectangulary symmetrical to the paired pivot bearings and within the yoke arms, with clearance provided for about one hundred and eighty degrees of free rotation around the pivot bearings, a first rectangular box-like receptacle and therewithin a second similar and sensibly smaller rectangular box-like receptacle, the said receptacles severally adapted by virtue of size and by virtue of location on internal rail and roller mounting means to afford reciprocal, sliding, unidirectional, telescopic extending and retracting movement of the said second receptacle within, but not beyond the confines of, the said first receptacle, the face of the said second receptacle open toward the direction of extending telescopic travel and the corresponding immediately adjacent face of the said first receptacle contour curved, vertically concave, thereby to provide an approximate matching surface for operational tree trunk contact, the curved face of said first receptacle provided with a horizontally disposed rectangular slot of dimensions sufficient to allow rotational clearance therethrough for an approximately ninety circular degree, peripheral, chord shaped portion of a horizontally disposed rotary cutter head of preselected size; bark abrading component in the form of a rotary cutter head, disc shaped with curved peripheral surface bladed or selectively abrasive, together with an associated driving motor, both cutter head and driving motor rigidly mounted within the said second receptacle, the rotary cutter head positioned axially vertical and with approximately ninety circular degrees of peripheral, chord shaped cutter head exposure extended beyond the open face confines of the said second receptacle and extended similarly through the afore-recited horizontally disposed, rectangular slot of the said first receptacle and beyond the contour curved face of the said first receptacle at such time as the said receptacles are at the position of maximum telescopic extension, there being substantially no exposure of the cutter head beyond the confines of the said first receptacle at the position of maximum telescopic retraction;

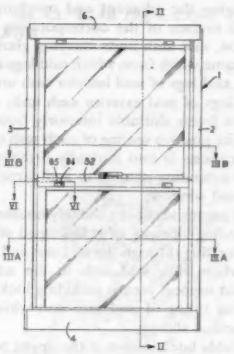
resilient restraining means interposed at all locations intervening adjacent components where relative motion, whether linear or rotational, of the components is required, said resilient restraining means severally adapted to apply a progressively increasing restraint related directly to the degree of relative motion of the adjacent components, said resilient restraining means severally characterized by a minimum degree of restraint that is at least the amount of restraint required to urge the operating rotary cutter head through the bark of a vital tree trunk down to the cambium layer;

means for vertically positioning the horizontal boom components along the rod member of the principal apparatus support in the form of a closed loop roller chain with one sector deployed via idler sprockets adjacently parallel the rod member of the vertical boom, the inboard end of the horizontal boom fixedly attached at one point along the vertical boom parallel deployed sector of said chain, said chain in its entirety actuated via a reversible driving motor and drive sprocket mounted stationary to act on a sector of the closed loop roller chain outside that sector deployed adjacent the vertical boom, operation of the reversible driving motor adapted, selectively to raise, to lower and to operatively position the horizontal boom components along the rod member of the vertical boom and thereby place the rotary cutter head at a preselected height location on the trunk of the tree to be abraded.

3,959,926
TILT WINDOW

Marshall V. Noecker, Grosse Pointe; Kenneth C. Thom, Birmingham, and Charles Harp, Jr., Farmington, all of Mich., assignors to Kaufmann Window and Door Corporation, Detroit, Mich.

Filed Oct. 2, 1974, Ser. No. 511,291
Int. Cl.² E06B *3/32, 1/04*
U.S. Cl. 49—181 **13 Claims**



1. In a tilt-in-type window insertable in a window opening and having a metal frame and sash, the combination comprising:

a frame having a pair of upstanding stiles laterally opposed to each other in said window opening.

a said stile having a stepped transverse end wall, and uniformly spaced and parallel inside, middle and outside flanges extending laterally inboard from said end wall toward the other stile, said stepped end wall comprising an outside traverse web, an inside transverse web offset laterally outboard therefrom and a lateral step joining the adjacent ends thereof and formed by the laterally outer end portion of said middle flange, said flanges and end wall forming a pair of U-shaped sections opening laterally inboard with the legs of the U-shapes formed by said flanges, the interior one of said U-shaped sections being offset laterally outboard with respect to the exterior U-shaped section along a common leg formed by said middle flange;

said stile further comprising a pair of coplanar transverse flanges in each U-shaped section and spaced laterally inboard from said end wall by a common spacing and closing the outboard portion of the corresponding U-shaped section except for a slot between the opposed edges of such pair of transverse flanges, so as to define an undercut upstanding slideway in the outboard portion of each U-shaped section, said transverse flanges of said interior U-shaped section being offset laterally outboard of the transverse flanges of said exterior U-shaped section, the inboard edge of said inside flange carrying one said transverse flange, said middle flange carrying a second said transverse flange offset outboard of its laterally inboard edge by an interior facing sealing surface and carrying a third said transverse flange at its inboard edge, said outside flange carrying the fourth said transverse flange offset outboard from its laterally inboard edge by an interior facing sealing surface, the inboard faces of

said first and third transverse flanges being further sealing surfaces, such that said U-shaped sections each have a said interiorly facing sealing surface on the exterior-most leg thereof and a laterally inboard facing sealing surface on the interior-most transverse flange thereof, wherein said sealing surfaces are arranged in a stairstep-like series proceeding interiorly and laterally outboard on said stile;

double-hung interior and exterior sash units respectively disposed between the laterally opposed interior U-shaped sections and exterior U-shaped sections of said stiles, the sides of said sash units each having, in cross section, an interior leg terminating in a laterally outboard facing seal strip sealingly opposed to said interior sealing surface of said transverse flange of the corresponding U-shaped stile section, and an exterior leg terminating immediately laterally inboard of the exterior transverse flange of said U-shaped section and having an exterior facing sealing strip engaging the adjacent and overhanging interiorly facing seal surface of the corresponding said U-shaped stile section, said sash units carrying glazing of substantially the same width from which said legs extend laterally outboard, said legs of said interior sash unit being longer than said legs of said exterior sash unit, such that each sash unit is freely shiftable interiorly from between said stiles despite positive sealing of each sash unit edge at two spaced locations in two mutually orthogonal planes respectively extending parallel to and perpendicular to the plane of said window;

sash support means vertically slidably housed in said undercut upstanding sideway of a U-shaped stile section and means extending through the said slot and connecting the lower portion of a said sash to the adjacent support means, said support means including lock means permitting interior tilting of said sash unit while locking same against vertical sliding;

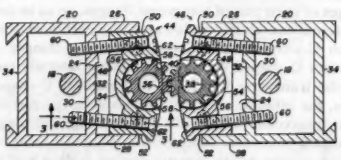
laterally slidable latch means at the upper portion of a said sash unit extensible through said slot and into engagement with the interior one of the transverse flanges of the opposed U-shaped stile section to limit said sash unit to vertical sliding motion and retractable from said slot inboard beyond said last mentioned transverse flange for free pivoting of said sash unit interiorly from said stile, wherein during said pivoting the exterior and interior seal strips of the sash respectively move away from and slidably along the opposed seal surfaces of the adjacent U-shaped section, said latch member holding said seal strips snugly in position against said seal surfaces of said stile in the normal upright condition of said sash, the exterior one of said sashes being freely tiltable interiorly in laterally spaced relation from said interior U-shaped stile section.

3,959,927

SEALING ASSEMBLY

Samuel William Good, Lancaster, assignor to Zephyr Aluminum, Incorporated, Lancaster, Pa.

Filed Dec. 4, 1974, Ser. No. 529,292
Int. Cl.² E06B 7/16
U.S. Cl. 49—368 **6 Claims**



4. A door assembly adapted to be mounted within a door frame, said door assembly comprising;

a pair of adjacent swinging doors, each door having spaced apart hinge and swinging stiles, each of said swinging stiles being provided with a vertically extending recess open to the adjacent stile, the recess being defined by a pair of spaced apart side members and a recessed inner member which extends between the side members;

a pair of hinge means interconnecting said hinge stiles of said pair of doors to spaced apart portions of the frame in such a manner that each door swinges about a hinge line remote from the swinging stile with the swinging stiles of the pair of doors being disposed adjacent each other when said pair of doors are closed;

sealing means to seal the gaps between the adjacent swinging stiles, said sealing means including a pair of generally cylindrical substantially identical elements which are provided with a plurality of spaced apart teeth which extend radially outwardly from the axis of the associated elements; and

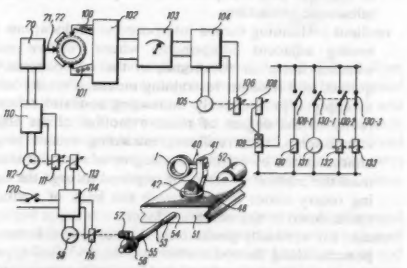
a pair of mounting means to mount the sealing means along the edges of the adjacent swinging stiles in such a manner that the elongated members interengage each other throughout their lengths, each of said pair of mounting means including structure for mounting an associated cylindrical element for rotational movement about its axis, said structure being received within the vertically extending recess of the associated swinging stile and said structure being provided with a channel which receives the elongated members, said channel having a cylindrical surface having an opening on one side, the extent of the cylindrical surface being sufficient to maintain the first element within the channel against lateral displacement, each of said mounting means further including fastener means to secure the associated structure to the swinging stile within said vertically extending recess, and said mounting means further including means to adjustably secure said structure to one of said adjacent stiles.

3,959,928

APPARATUS FOR MICRO-FINISH MACHINING OF COMPOUND, CIRCULAR ARC-SHAPED PROFILED SURFACES IN ANNULAR WORKPIECES

H. Günter Schmitz, Wermelskirchen, Germany, assignor to Supfina Maschinenfabrik Hentzen KG, Remscheid, Germany

Filed July 31, 1974, Ser. No. 493,467
Claims priority, application Germany, Aug. 6, 1973, 2339726
Int. Cl.² B24B 49/04
U.S. Cl. 51—58 **6 Claims**



1. In an apparatus for micro-finish machining of circular arc-shaped profiles in annular workpieces in two phases including: means mounted the workpiece to the apparatus; a honing tool; means mounting the honing tool for pivotal movement about an axis which is perpendicular the longitudinal axis of the mounted workpiece; means for pressing the honing tool against the profiled surface to be machined; and means rotating the workpiece whose profiled surface is being

machined relative to the honing tool, the improvement comprising:

a. displacement means for displacing the honing tool mounting means and consequently the honing tool in a direction parallel to the longitudinal axis of the mounted workpiece;

b. a measuring instrument which engages the workpiece prior to its engagement with the honing tool and measures the location of a plane containing the point of maximum curvature of the profiled surface with respect to a reference plane which coincides with the plane containing one end face of the workpiece profiled surface is to be machined, the measuring instrument including signal generating means indicative of the measurement made; and

c. control means including means for receiving the signal produced by the signal generating means and storing the signal, said control means being connected to the displacement means for effecting displacement of the honing tool mounting means and consequently the honing tool in the parallel direction as a function of the stored signal so that the position of the pivotal axis defined by the honing tool mounted means corresponds to the distance of the plane containing the point of maximum curvature from the reference plane.

3,959,929

DEVICE FOR PRECISION GRINDING AND POLISHING OF WORKPIECES

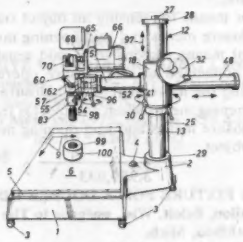
Johann R. Fleischmann; Willy Fechter, and Heinrich Schmidt, all of Nurnberg, Germany, assignors to Doll & Co., Nurnberg, Germany

Filed Apr. 18, 1974, Ser. No. 462,122

Claims priority, application Germany, Apr. 21, 1973, 2320349

Int. Cl.² B24B 7/02

U.S. Cl. 51—68 **11 Claims**



1. A device for precision grinding and polishing the surfaces of a workpiece comprising a base means, a carrier for carrying said workpiece, operable means movably mounting said carrier on said base means such that said carrier and the workpiece carried thereon may be moved to desired positions relative to said base means, a post perpendicular to the general plane of said base means, a stand bushing adjustably mounted on said post for movement in a vertical and rotational direction relative to said post, a rack and pinion operably disposed between said post and said stand bushing, said rack being movably mounted about the circumference of said post, said stand bushing having a longitudinal groove in which said rack is slidable, said pinion being rotatably mounted on said stand bushing and meshing with said rack to provide for raising and lowering said stand bushing on said post, said stand bushing having means for adjustably supporting said carrying arm for longitudinal and angular movement, a carrying arm, means mounting said carrying arm on said stand bushing, a reciprocating device operable to reciprocate a tool, means mounting said reciprocating device on said carrying arm, said means for mounting said carrying arm being operable to provide for adjustability of said carrying arm in all three spacial coordinates, said tool being the carrier of a grinding or polishing medium for grinding or polishing said workpiece on said base means, said movable mounting of said carrier on said base means permitting said workpiece to be moved in the grinding and polishing process to thereby automatically align the workpiece with said tool.

3,959,930

APPARATUS FOR CUTTING OFF CAST PARTS FROM A RUNNER OF A CASTING BODY

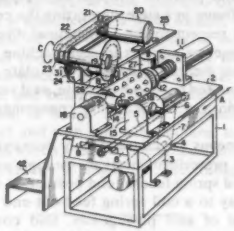
Masami Hatta, and Tetsusi Ohkawa, both of Yasugi, Japan, assignors to Hitachi Metals, Ltd., Japan

Filed Oct. 23, 1974, Ser. No. 517,377

Claims priority, application Japan, Oct. 24, 1973, 48-118988

Int. Cl.² B24B 19/00, 23/08

U.S. Cl. 51—92 ND **1 Claim**



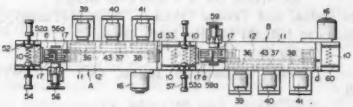
1. In an apparatus for cutting off cast parts from an outer periphery of a runner of a casting body comprising a bed, slidable mount means reciprocally movable on said bed, drive means for reciprocally moving said slidable mount means, holding means provided on said slidable mount means for rotatably carrying said casting body, means including a cutting grinder located laterally of said casting body and substantially parallel to the axis of said casting body for cutting off the cast parts from the runner, said cutting grinder being adapted to move on a grinder table supported on said bed, said grinder table being swingable about a line substantially normal to the axis of said casting body in plan view, and fluid operable cylinder means connected to said grinder table and said bed for moving and fixing said grinder table, wherein the improvement comprises a swingable lever having at an end a roller contacting with an outer periphery of the cutting grinder and a first actuator at the opposite end, first limit switches arranged along a locus of movement of said first actuator and spaced apart from each other for a predetermined distance so that the first limit switches may be operated by said first actuator, a second actuator secured to said grinder table, and second limit switches arranged along a locus of movement of said second actuator and spaced apart from each other for a predetermined distance so that the second limit switches may be operated by said second actuator, said first limit switches being adapted to operate said cylinder means to move said cutting grinder, said second limit switches being adapted to stop the operation of said cylinder means.

3,959,931

GRINDING MACHINE FOR COIL SPRINGS

Heijiro Shiguma, and Shigekazu Suzuki, both of Yokohama, Japan, assignors to NHK Spring Co., Ltd., Yokohama, Japan

Filed Oct. 21, 1974, Ser. No. 516,413
Claims priority, application Japan, Oct. 25, 1973, 48-120146
Int. Cl.[2] B24B 7/06, 7/16
U.S. Cl. 51—112 42 Claims



1. A grinding machine for grinding the end face of a coil spring, comprising:

a machine frame having a substantially horizontally extending passageway therein;

a plurality of carrier means each for receiving a coil spring therein, and movable through said passageway of said machine frame in a state supporting the coil spring crosswise with respect to the longitudinal direction in which said passageway extends in said machine frame, each of said carrier means including a base plate and receptacle means mounted on said base plate, said receptacle means having concave surfaces for engagement with a coil spring;

conveying means for consecutively conveying said carrier means at prescribed intervals through said passageway from a coil spring feed-in end position at one end of said passageway to a coil spring feed-out end position at the other end of said passageway, said conveying means including an endless chain, said base plates being secured in series to said endless chain;

clamping means provided on each of said carrier means and swingable between a clamping position for clamping the coil spring received by said each carrier means by engagement therewith, and a coil spring releasing original position in which the clamping means is disengaged from the coil spring;

grinding means disposed at the side of said passageway for grinding the end face of the coil spring fed by said carrier means through said passageway; and

urging means for urging said clamping means to said clamping position, the urging action of said urging means being rendered effective at least during a period of time in which the end face of the coil spring is ground by said grinding means.

3,959,932

FINISHING SYSTEM WITH CYCLICALLY OPERABLE CLOSURE CONTROL

John F. Rampe, Mayfield Heights, Ohio, assignor to Rampe Research, Cleveland, Ohio

Continuation-in-part of Ser. No. 500,094, Aug. 23, 1974, abandoned, which is a continuation-in-part of Ser. No. 270,700, , Pat. No. 3,831,322, which is a continuation-in-part of Ser. No. 8,815, Feb. 5, 1970, Pat. No. 3,685,213. This application June 2, 1975, Ser. No. 582,712
Int. Cl.[2] B24B 31/06
U.S. Cl. 51—163.1 25 Claims

1. A vibratory finishing machine comprising:

a. a supporting frame structure;

b. a tub structure carried on said frame structure but free to vibrate relative to said frame structure;

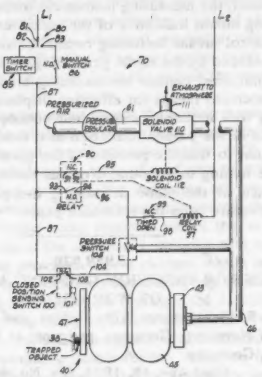
c. a vibration producing mechanism operably connected to said tub structure to vibrate said tub structure;

d. discharging means for controllably discharging materials from said tub structure, including:

i. opening means defining a discharge opening in communication with said tub structure;

ii. closure means movable toward and away from said opening means for selectively restricting the discharge of materials from said tub structure through said discharge opening to selectively retain and discharge materials in and from said tub structure;

iii. closure operator means connected to said closure means for moving said closure means toward and away



from said opening means to selectively restrict the discharge of materials from said tub structure through said discharge opening during the operation of said machine;

iv. sensor means for sensing an object trapped between said closure means and said opening means; and,

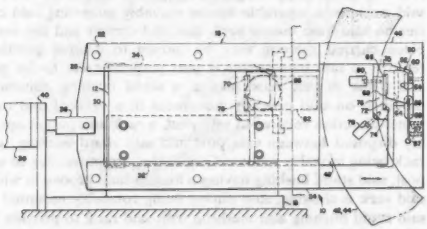
v. control means responsive to said sensing means and being connected to said closure operator means for reversing the movement of said closure means toward said opening means when an object is trapped between said closure means and said opening means to release such object.

3,959,933

CLAMPING FIXTURE FOR A DOUBLE DISC GRINDER

Herbert J. Fallon, Beloit, Wis., assignor to The Bendix Corporation, Southfield, Mich.

Filed Apr. 16, 1975, Ser. No. 568,537
Int. Cl.[2] B24B 41/06
U.S. Cl. 51—217 R 7 Claims



1. A workpiece clamping fixture for a double disc grinder comprising:

a support plate;

a moveable frame extending about the periphery of said support plate and mounted thereon for relative sliding movement with respect to said support plate with a clear-

ance space between said support plate and said moveable frame accommodating said relative movement;

a workseat disposed in said clearance space and affixed to one of said support plate or said moveable frame;

clamping means also disposed in said clearance space and carried by the other of said support plate or said moveable frame adapted to clamp workpieces to said workseat by relative movement of said support plate and moveable frame in such a direction so as to reduce said clearance space; and

actuating means for relatively moving said support plate and said moveable frame so as to cause said clamping means to be activated.

3,959,934

COMPOSITION AND METHOD FOR REPAIRING SELENIUM PHOTORECEPTORS

John Frank Byrne, Worthington, Ohio, assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 4, 1974, Ser. No. 512,804
Int. Cl.² B24B *1/00*
U.S. Cl. 51—317 **8 Claims**

5. A method for repairing a damage area on a selenium photoreceptor comprising:

a. providing a polish composition including (i) zinc oxide, (ii) a secondary suspending agent selected from the group consisting of silica aerogels and colloidal silicas and an abrasive, all three materials being suspended in an organic liquid medium selected from the group consisting of liquid hydrocarbons, alcohols and mixtures thereof;

b. applying the polish composition to a physically damaged area of a selenium photoreceptor; and

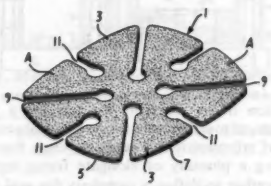
c. rubbing the polish composition about the damaged area so as to effect a smoothing of the physically damaged area of the photoconductor.

3,959,935

ABRASIVE PAD FOR GRINDING LENSES

Waldemar Stoppacher, Valhalla, N.Y., assignor to Interoptic Laboratories, Inc., Elmsford, N.Y.

Filed Mar. 18, 1975, Ser. No. 559,444
Int. Cl.² B24D *11/02*
U.S. Cl. 51—395 **2 Claims**



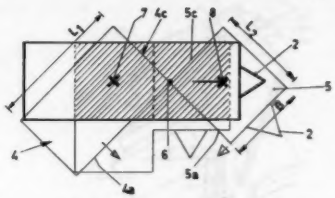
1. A pad for grinding lens blanks comprising a relatively porous and substantially water-resistant pliable sheet adapted to conform to the curved surface of a working tool, an adhesive coating on the underside of said pad for adhesively securing said pad to the surface of said tool and an abrasive surface on the other side thereof, a plurality of radially extending channels cut through the area of said pad, said radially extending channels being defined by parallel radial sides extending from the periphery of said pad toward the center thereof and an arched segment joining the inner ends of said radial sides.

3,959,936

TRANSPORTABLE HOUSE, PARTICULARLY OF THE CARAVAN-TYPE

Guus Lambooy, Meije 90, Gemeente Bodegraven, Netherlands

Filed Mar. 31, 1975, Ser. No. 563,720
Int. Cl.² E04B *1/346*
U.S. Cl. 52—65 **1 Claim**



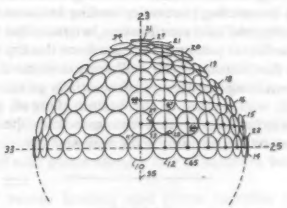
1. A mobile home comprising at least two sections arranged one behind another on a common integral substructure which is mounted on wheels, said sections being generally rectangular in plan and having vertical sides, characterized in that each of said sections is mounted on a pivot located in the central longitudinal plane of said common integral substructure, at least one of said pivots being longitudinally slidable in said substructure, two sections being hinged together at one corner of each section, and being movable on their pivots, from a transport position in which they are longitudinally aligned with one another and with said substructure, to a transverse position of use in which a side of one section and a side of the other section, formerly in alignment, are folded together on said hinge.

3,959,937

MODULAR DOME STRUCTURE

Leonard Spunt, 7809 McNulty St., Canoga Park, Calif. 91306

Filed June 17, 1974, Ser. No. 479,611
Int. Cl.² E04B *1/32*
U.S. Cl. 52—81 **7 Claims**



1. A dome structure comprising:

a multiplicity of elements with substantially circular peripheries, each of the same diameter, said elements disposed on the surface of an imaginary dome that has a predetermined pole location, and most of said elements fastened near their peripheries to the peripheries of only four other of said elements to form the frame of a dome;

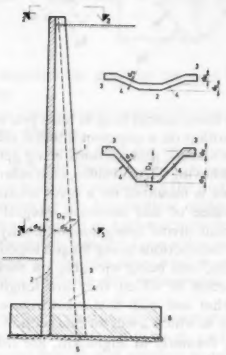
said elements including a first plurality of elements arranged along four imaginary meridian lines that pass through said pole location, and at least three sets of additional elements arranged in progressively lower rows, with an element in each row positioned with its upper end bridging the gap left between a pair of elements in the next higher row.

3,959,938

WALL SYSTEM OF CORRUGATED SECTIONS

John Zachariassen, 30 Krogshojvej, DK-2880 Bagsvaerd, Copenhagen, Denmark

Filed June 26, 1974, Ser. No. 483,443
Claims priority, application United Kingdom, July 2, 1973, 31395/73
Int. Cl.[2] E02D 27/30; E04C 2/32
U.S. Cl. 52—293 7 Claims



1. A corrugated wall system composed of prefabricated wall sections, each wall section having two distinct front portions and a rear portion, said front and rear portions spaced from each other by the dimension of corrugation of said wall section, and a connecting portion extending between each of said front portions and said rear portion, wherein the thickness of said front and rear portions increase from the top of each wall section to the bottom of the wall section while the thickness of said connecting portions is substantially constant from the top of each wall section to the bottom thereof, and wherein the dimension of corrugation increases from the top of each wall section to the bottom of the wall section.

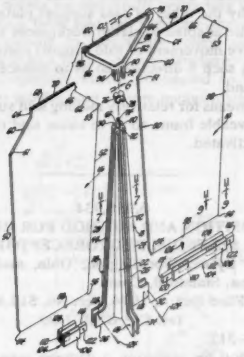
3,959,939

BUILDING STRUCTURE

John S. Hodge, 2350 Westridge Court, Ferndale, Mich. 48220

Division of Ser. No. 340,595, March 12, 1973, Pat. No. 3,861,102. This application Nov. 20, 1974, Ser. No. 525,469
Int. Cl.[2] E04H 12/00; E04C 3/30
U.S. Cl. 52—301 12 Claims

1. Load bearing structural column capping means, comprising capping body means, said capping body means comprising generally lower disposed base means integrally formed with upper disposed wall-defining plate-like means, generally upwardly facing support surface means carried generally by said plate-like means and extending generally transversely of said body means and said plate-like means, said support surface means being effective for supporting thereon associated structure, said lower disposed base means having formed thereon at a lower end thereof downwardly facing mounting surface means extending generally transversely of said body means and said base means and parallel to said support surface means, said mounting surface means being effective when



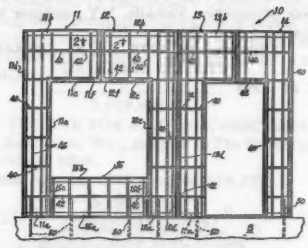
operatively placed atop associated structural column means for vertically supporting said capping body means.

3,959,940

REINFORCING ASSEMBLY AND REINFORCED CONCRETE BUILDING WALLS

Lawrence R. Ramberg, 2125 S. Tonne Road, Arlington Heights, Ill. 60005

Continuation-in-part of Ser. No. 324,316, Jan. 17, 1973, abandoned. This application Apr. 8, 1974, Ser. No. 458,991
Int. Cl.[2] E04B 1/16
U.S. Cl. 52—348 9 Claims



1. A skeleton frame assembly for forming a reinforced concrete structural member, said frame assembly comprising:

1. a pair of adjacent frame sections, each frame section comprising a plurality of elongate frame members secured together to define a periphery for said frame section, an opposed pair of vertical frame members being generally J-shaped in end view and each of the legs of the J-shaped members defining a plurality of spaced openings along its length, at least one first elongate reinforcing rod, each of said rods being disposed in an opening in the shorter of the legs, at least one end of each of said first reinforcing rods lying within the periphery of its frame section, and at least one second elongate reinforcing rod secured to and crossing said first reinforcing rods to define therewith and with said frame section an open reinforcing network, the ends of each of said second rods lying within the periphery of its frame section, said pair of frame sections having a long leg of a J-shaped member of each in butting engagement;

2. a plurality of short reinforcing rods in openings in adjacent ones of the long legs of said butting frame members, whereby when concrete is applied to said adjacent pair of frame sections, the frame sections are tied together by said short reinforcing rods.

3,959,941

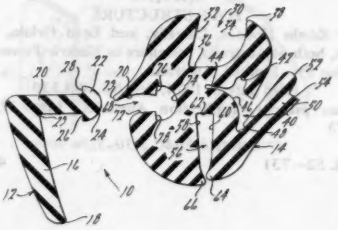
WEATHER STRIP WITH INSERTABLE COVER STRIP

Leonard W. Smith, Freemont, Ohio, assignor to The Standard Products Company, Cleveland, Ohio

Continuation of Ser. No. 451,473, March 15, 1974, abandoned. This application Feb. 5, 1975, Ser. No. 547,108

Int. Cl.² B60J 1/00; E04F 15/14

U.S. Cl. 52—400 3 Claims



1. Mounting and trimming elements for a thin panel within an opening in a supporting structure having an inner liner, said elements embodying a resilient gasket having a first pair of oppositely outwardly presenting vertically disposed recesses for the acceptance of the edge portions of said panel and supporting structure respectively in substantially vertical aligned relation, a second pair of outwardly presenting recesses in substantially horizontal aligned relation disposed between said first pair of recesses located substantially normal thereto, a lock strip disposed in one of said second pair of recesses for exerting a closing bias on said first pair of recesses to pinch said gasket against said panel and supporting structure respectively, a cover strip having one edge extending into the other of said second pair of recesses which has an inner enlargement, and an enlargement along said one edge of said cover strip which is within said recess for extending into the enlargement provided therein.

3,959,942

COMBINED SPACER AND TRANSVERSE REINFORCING BEAM

Karol J. W. Merson, Mississauga, Canada, assignor to Wonder Steel Manufacturing International (Ontario) Limited, Mississauga, Canada

Filed July 2, 1975, Ser. No. 592,407

Int. Cl.² E04D 1/30; E04C 2/32

U.S. Cl. 52—551 12 Claims

1. A sheet metal structure comprising:

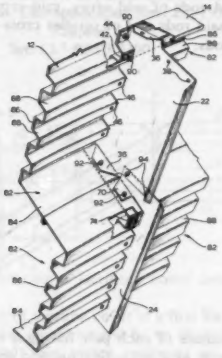
a. at least two panels of substantially the same cross section connected to one another by a lap joint at their outer ends,

b. each panel having at least one major U-shaped section which has a base wall and a pair of oppositely disposed side walls, said base wall being formed with a plurality of minor U-shaped longitudinally extending ribs, said ribs forming a plurality of alternately disposed minor crests and valleys,

c. the major U-shaped sections and the minor ribs of said panels nesting with one another at said lap joint.

d. a spacer panel having a body portion, said body portion having a spacer edge extending transversely across said major U-shaped section.

e. a plurality of spacer lugs at said spacer edge projecting outwardly from said body in a spaced relationship, said lugs having a thickness substantially equal to the thickness of said panels,



f. said lugs being located between overlapping base walls of said panels and spacing said base walls apart to permit nesting of the ends of said panels at the lap joint without requiring deformation of either nesting panel.

3,959,943

RIVETED CELLULAR PANEL ASSEMBLY

Yale R. Shea, Hales Corner; Arthur B. Thelen, and H. William Parsons, both of Milwaukee, all of Wis., assignors to INRYCO, Inc., Melrose Park, Ill.

Filed Jan. 23, 1975, Ser. No. 543,319

Int. Cl.² E04B 2/28; E04C 2/32

U.S. Cl. 52—618 10 Claims

1. A cellular floor panel assembly comprising:

a first plate and a second plate, at least one of said plates having a plurality of generally parallel troughs, the other of said plates covering the troughs of said one of said plates to define generally parallel enclosed cells, said plates having an electrically non-conductive protective coating on all surfaces,

one of said plates being provided with at least one stiffening rib parallel to said cells, said rib being in contact with the other of said plates along a line of juncture between said plates, and

fastening means holding said plates together comprising rivet-like fasteners passing through both of said plates in at least one area of contact therebetween.

3,959,944

MOUNTING AND/OR FIXING MEMBER FOR A REINFORCEMENT OR REINFORCING ELEMENT FOR USE IN REINFORCED CONCRETE STRUCTURES

Georgi Oroschakoff, Schutzengasse 27, Vienna III, Austria

Continuation of Ser. No. 263,105, June 15, 1972, abandoned. This application Mar. 27, 1974, Ser. No. 455,317

Claims priority, application Austria, June 16, 1971, 5221/71; July 8, 1971, 5963/71

Int. Cl.² E04C 5/04, 2/42

U.S. Cl. 52—665 3 Claims

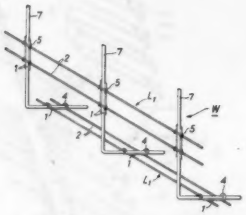
1. A concrete-reinforcement assembly comprising:

an array of transversely spaced mutually parallel reinforcing rods; and

a plurality of fixing members spaced apart along said reinforcing rods and extending transversely of said rod array, each of said fixing members comprising:

a pair of elongate mutually parallel spaced-apart longitudinal bars of smaller cross-section than that of said rods and extending transversely across said rod array,

a plurality of pairs of shorter mutually parallel crossbars connected to said longitudinal bars and extending parallel to said rods of said array, said crossbars being shorter than said rods and of smaller cross-section than that of said rods,



the crossbars of each pair having a spacing less than the diameter of a respective rod and cradling same between them,

each of said cross bars having both its ends projecting beyond respective ones of said longitudinal bars and bent over, across, partly around and embracing the respective rod and contoured to fit therearound whereby corresponding ends of a pair of crossbars laterally overlap atop the respective rod; and

a weld seam joining the overlapped ends of the respective transverse pairs of crossbars at each extremity of the respective pair.

3,959,945

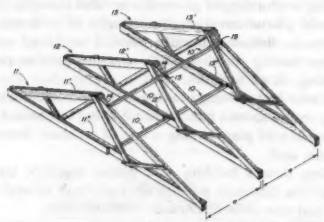
ROOF TRUSS SPACER

David Allen, 1121 E. Fifth St., Berwick, Pa. 18603

Filed May 9, 1975, Ser. No. 576,216

Int. Cl.² E04C *3/11*

U.S. Cl. 52—690 **2 Claims**



1. A prefabricated truss comprising

a. a spacer pivotally attached to a chord of said truss and adapted to space said truss from a similar adjacent truss in a structure,

b. said spacer comprises an elongated member having an upper surface and a downwardly extending leg with a length equal to the desired space between said truss and said adjacent truss,

c. tabs located on either end of said upper surface which extend said upper surface beyond the extent of said downwardly extending leg,

d. connecting means for pivotally securing one of said tabs to said chord whereby said elongated member may extend parallel to said chord with the inside surface of said downwardly extending leg contacting said chord and may be rotated therefrom 90° to place an end of said downwardly extending leg in contact with said chord and to position said elongated member perpendicular to said chord, and

e. said connecting means comprises

i. a sole aperture in said one of said tabs located with its center positioned on said tab equidistant from said inside surface of said downwardly extending leg on an axis which is parallel thereto and from said end of said downwardly extending leg on an axis which is perpendicular to said inside surface, and

ii. a pin-like member passing through said aperture secured to said chord.

3,959,946

POLE STRUCTURE

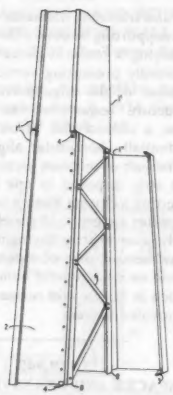
Harold Edwin Holmes, Clovelly, and Enzo Oriolo, Darling Point, both of Australia, assignors to Electric Power Transmission Pty. Limited, Australia

Filed July 3, 1974, Ser. No. 485,530

Claims priority, application Australia, June 27, 1973, 3854/73

Int. Cl.² E04C *3/30, 3/34*

U.S. Cl. 52—731 **4 Claims**



1. A pole structure for supporting electrical power transmission lines or the like, said pole structure being at least four sided in cross section, one pair of opposing sides of the pole structure formed by substantially imperforate structural plates which extend continuously for substantially the entire height of the pole structure, the other pair of opposing sides of the pole structure being formed of open lattice-type bracing which extends continuously for substantially the entire height of the pole structure in interconnecting relationship with said one pair of sides, the improvement which comprises substantially imperforate shrouds hinged along corresponding longitudinal edges to at least one side of the pole structure in said one pair, said shrouds arranged in end-to-end relationship adjacent said other pair of sides and forming substantially continuous uninterrupted coverings for said other pair of sides for substantially the entire height of the pole structure, whereby said open latticetype bracing is fully concealed and the pole structure has an aesthetic appearance imparted to it.

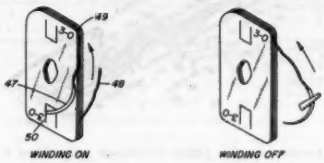
3,959,947
WINDING SUTURE REEL-LABELS

Mario Sonnino, New Canaan, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 386,672, Aug. 8, 1973, Pat. No. 3,876,068. This application Feb. 27, 1975, Ser. No. 553,392

Int. Cl.² B65B *25/00*, *63/04*

U.S. Cl. 53—21 FW 3 Claims



1. A method of loading and unloading a reel-label surgical suture combination,

in which the reel-label has:

two superimposed panels of stiff sterilizable label stock having a heat sealable facing on one side;

said panels being rectangular, with rounded corners, with the superimposed rounded corners having different radii;

accordion pleat folds joining the two panels on two parallel edges;

an infolded panel ear strengthening the top and bottom of each said panel;

cut-out tabs near the top and bottom of each panel, said tabs being heat sealed to tabs from the opposing panel, to hold said panels together;

said panels each having therein a hole, said holes being in registration, and forming a spin axis substantially at the center of said panels;

said tabs and said accordion pleat folds forming a suture holding groove, to frictionally hold a suture therein;

said groove being effectively continuous and operatively centered towards said spin axis;

at least one of said panels having therein at least one needle retaining cut-out adapted to hold the sharp end of at least one needle between panels in protective relationship;

comprising inserting a surgical needle attached to a suture into a needle retaining cut-out, and winding the suture in friction holding relationship into a suture holding groove around the periphery of said reel-label, with the free end being wound onto said reel-label last;

retaining the suture in the groove by friction of the pleats against the suture during shipment and storage;

and on serving at time of use, under sterile conditions, removing said needle first, and then unwinding the suture with the initial windings passing the later windings in said suture holding groove while retaining said later windings by friction in said groove, so that the free end is released from frictional retention in said suture holding groove in said reel-label last.

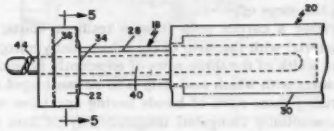
3,959,948
METHOD OF PLACING A STERILIZED SHEATH ON A PROBE

Charles F. Fowler, 5157 Park West Ave., San Diego, Calif. 92117, and Samuel G. Dawson, 1869 Hidden Mesa Road, El Cajon, Calif. 92020

Division of Ser. No. 409,926, Oct. 26, 1973, Pat. No. 3,850,084, which is a division of Ser. No. 230,790, March 1, 1972, which is a continuation-in-part of Ser. No. 85,388, Oct. 30, 1970, abandoned. This application Nov. 25, 1974, Ser. No. 526,464

Int. Cl.² B65B *5/00*

U.S. Cl. 53—35 5 Claims



1. A method of placing a sterilized cover over a probe comprising:

grasping the jacket of a probe cover at a first location, said probe cover being characterized by an elongated jacket of sheet material, said jacket enclosing an elongated sheath of sheet material, said jacket and said sheath each having an opening at a common end of said sheath and jacket,

inserting an elongated probe through said opening and into said sheath,

grasping said jacket at a second location spaced from said first location,

pulling in opposite directions on said jacket at said first and second locations to cause said jacket to part into at least two jacket portions,

removing at least one of said jacket portions from said sheath, exposing a substantial part of said sheath.

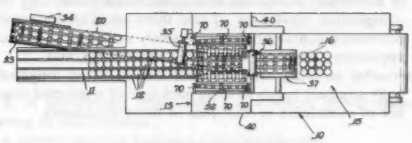
3,959,949
SYSTEM, MACHINE AND METHOD FOR MULTIPACKAGING CONTAINERS

Edward Leonard Benno, Grayslake; David Frederick Schlueter, and Lonnie Ray Seymour, both of Hoopeston, all of Ill., assignors to Illinois Tool Works Inc., Chicago, Ill.

Filed June 2, 1975, Ser. No. 583,079

Int. Cl.² B65B *27/04*, *13/04*

U.S. Cl. 53—35 9 Claims



1. In combination, a resilient, stretchable plastic material strip comprising at least three rows of bands with said bands elongated in the longitudinal direction of said rows, web means integrally interconnecting said bands longitudinally in said rows and transversely between said rows, the shape of said bands and the interconnections of said web means between said bands producing bands apertures substantially complementary to the circumferential configuration of certain containers responsive to the application of transversely opposed stretching forces of a certain amount solely to the side marginal portions of said strip, a work station, means moving at least three adjacent rows of said certain containers through said work station, a series of pairs of opposed longitudinally

arranged stretching members, means for applying the side marginal portions of said strip onto said series of pairs of opposed stretching members, means for moving said series of pairs of opposed stretching members to apply opposed stretching forces of said certain amount to said side marginal portions of said strip and means for successively moving said series of pairs of opposed stretching members with said strip applied thereon and stretched said certain amount into said work station and in a direction relatively toward said moving rows of said certain containers to circumferentially apply said bands successively about said certain containers.

3. A packaging system for multipackaging three substantially adjacent rows of containers into packages of a selected number of containers in multiples of three containers, comprising the steps of:

providing a carrier strip from a resilient elastic plastics-material with the strip being substantially narrower than the width of the three rows of adjacently positioned containers with which said strip is to be associated and comprising three rows of bands having apertures which are substantially elongated longitudinally of said strip and with said three rows of bands being integrally interconnected transversely and longitudinally of said strip to stretch said apertures into substantially complementary shapes to those of said containers when the inner margins of the outboard band portions of the transversely outward bands are moved transversely apart a distance at least as great as the width of said three rows of substantially adjacently positioned containers,

moving said three rows of substantially adjacently positioned containers continuously in a substantially straight-line through a work station,

applying a series of pairs of force applicating elements which are spaced-apart a distance less than the width of said strip successively within the outboard apertures of said strip,

thereafter successively moving said force applicating elements apart to transversely stretch each transverse series of three bands in said three rows of bands,

successively moving said force applicating elements into said work station toward the tops of said three rows of moving containers, while continuing to successively move said pairs of force applicating elements apart,

thereafter successively moving said force applicating elements relatively toward and downwardly over the tops of said three rows of moving containers when said force applicating elements are moved apart sufficiently to clear the outboard containers in said three rows of substantially adjacently positioned containers,

thereafter successively moving said force applicating elements relatively upwardly from the tops of said three rows of adjacently positioned containers while continuing the straight-line movement of said three rows of adjacently positioned containers to successively withdraw said force applicating elements from said applied strip, and

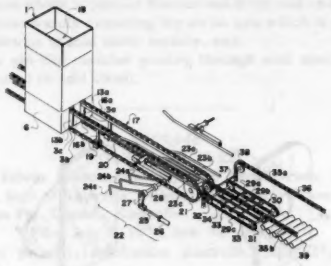
thereafter severing said strip between selected longitudinally adjacent bands to form packages of a selected number of containers in multiples of three containers.

3,959,950
PACKAGING SYSTEM

Nobuyoshi Fukuda, 27-4 Betsusho 2 chome, Urawa, Saitama, Japan

Filed Mar. 17, 1975, Ser. No. 558,890
Int. Cl.² B65B 5/04, 7/20
U.S. Cl. 53—37 7 Claims

1. A process for packaging an article within a rectangular foldable container while on a conveyor comprising the steps of: (a) introducing an article to be packaged onto a conveyor system having at least two elevated conveyor tracks which are spaced apart and extend parallel to each other for carrying the article thereon; (b) placing a container over and around the article on the conveyor system, said container having four walls defining a container space and pairs of upper and bottom end and side flaps which extend respectively from the opposed upper and lower extremities of said walls, each of said bottom end flaps having slots therein equal in number to the number of conveyor tracks to thereby subdivide said bottom end flaps into a plurality of separately foldable segments, said bottom flaps depending in coplanar relation from the respective con-

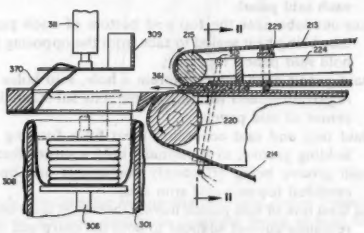


tainer walls, and said container being oriented such that the pair of bottom end flaps extend transversely of the conveyor tracks and the slots in the pair of bottom end flaps extend vertically and receive said tracks therewithin; (c) folding the pair of bottom end flaps of the container to a closed position while it is on the conveyor system; and (d) folding the remaining flaps to a closed position.

3,959,951
FOOD PACKAGING MACHINE

Eugene H. Paules, Red Lion, Pa., assignor to ExCel Engineering, Inc., Red Lion, Pa.

Division of Ser. No. 390,370, Aug. 22, 1973, Pat. No. 3,849,969. This application Aug. 22, 1974, Ser. No. 499,443
Int. Cl.² B65G 57/11
U.S. Cl. 53—162 7 Claims



1. Receptacle means for collecting wrapped items of predetermined thickness from a motive conveyor comprising:

a. first piston means situated to collect items from said motive means, one on top of another;

b. plunger means located above said piston means; and

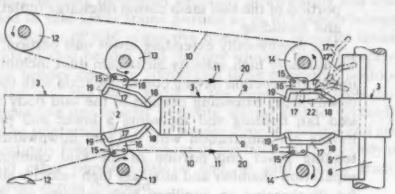
c. control means for operating said plunger automatically, tp drive said first piston means downward, when said item is positioned in proper relation to said receptacle means, by a predetermined distance, said plunger being adjustably regulated by said control means whereby said predetermined distance substantially equals said thickness of said items being received from said motive means.

3,959,952

PACKAGING APPARATUS USING HOSE-SHAPED WRAPPER

Gert Deutschlander, Neuhausen am Rheinfall, Switzerland, assignor to S I G Schweizerische Industrie-Gesellschaft, Neuhausen am Rheinfall, Switzerland

Filed Aug. 12, 1975, Ser. No. 603,508
Claims priority, application Switzerland, Aug. 27, 1974, 11682/74
Int. Cl.² B65B 9/06, 51/26
U.S. Cl. 53—373 2 Claims



1. In a packaging apparatus using a hose-shaped wrapper, including a table on which the wrapper of indefinite length is advanced in the direction of its length, the wrapper containing uniformly spaced groups of articles to be packaged; cooperating rotating welding shoes disposed in the path of travel of the wrapper for transversely bonding together wall portions of the wrapper between two article groups; endless chains formed of jointed links and disposed above the table at both sides of the travelling path of the wrapper; each chain having a chain portion extending adjacent and parallel to the travelling path of the wrapper along a long portion positioned upstream of the welding shoes as viewed in the direction of wrapper feed; sprockets for driving and supporting the chains for effecting a travel of the pressing members that is codirectional with the wrapper feed along the chain portion; a plurality of pressing members secured to the chains at a predetermined distance; each pressing member on one chain cooperates with a pressing member on the other chain for pinching together the wrapper and supporting it laterally as it is fed through the welding shoes; each pressing member includes two pressing fingers; the improvement comprising a unitary holder provided for each pressing member; the pressing fingers of each pressing member being affixed to the unitary holder; said holder being pivotally secured to two successive chain joints, one of said successive chain joints being a leading joint and the other being a trailing joint; one of said two pressing fingers of each pressing member being a leading pressing finger and the other being a trailing pressing finger; said leading pressing finger projecting from the leading chain joint supporting the associated holder to such an extent in the direction of wrapper feed as admitted by the distance between the sprocket closest to the welding shoes and the travelling path of the welding shoes.

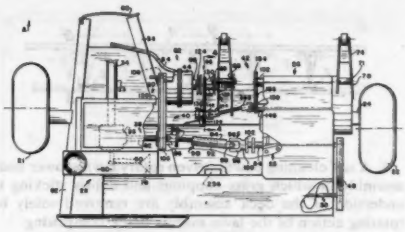
3,959,953

APPARATUS TO DETECT THE PASSAGE OF FERROUS MATERIAL IN CROP HARVESTING MACHINES

William L. Garrott, Gainesville, Fla., assignor to Sperry Rand Corporation, New Holland, Pa.

Filed Dec. 4, 1974, Ser. No. 529,305
Int. Cl.² A01D 75/18
U.S. Cl. 56—10.2 22 Claims

1. A crop harvesting machine comprising:
a. a frame adapted to travel across a field;
b. means mounted to the frame for delivering crop material from the field to said frame;
c. means positioned rearwardly of the delivering means and mounted on said frame for processing the crop material delivered to said frame;
d. means operably associated with the processing means and positioned between said delivering means and said processing means to compress said crop material;
e. means for detecting ferrous metal in the immediate vicinity of said compressing means between said delivery means and said processing means; and



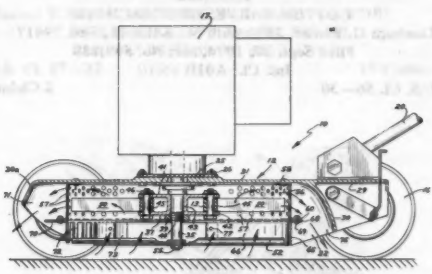
f. means for interrupting the operation of the harvesting machine, said interrupting means being responsive to the detection of ferrous metal in the vicinity of the comprising means by said detecting means.

3,959,954

GRASS CUTTING AND PULVERIZING ROTARY MOWER

Lawrence E. Halsten, 20165 Cottagewood Ave., Excelsior, Minn. 55331

Filed Feb. 20, 1975, Ser. No. 551,082
Int. Cl.² A01D 35/26
U.S. Cl. 56—12.8 5 Claims

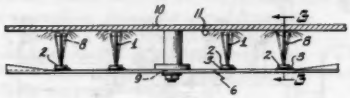


1. A pulverizing attachment for a rotary power mower, having in combination
a mower housing having a chamber therein,
power means carried by said housing,
a drive shaft from said power means disposed in said chamber,
a cutting blade mounted on said drive shaft adjacent the lower end portion thereof in the lower portion of said chamber,
a pulverizing member mounted on said drive shaft spaced upwardly of said cutting blade within the upper portion of said chamber,
the upper portion of said housing comprising a vertically disposed apertured plate member about said pulverizing member at the upper portion of said chamber, and
the lower portion of said housing comprising a vertically disposed imperforate plate member about said cutting blade within the lower portion of said housing.

3,959,955
SELF CLEANING ROTARY LAWN MOWER BLADE AND DECK ASSEMBLY

David M. Smith, 600 E. Third St., Hobart, Ind. 46342, and Frederick C. Mennen, 506 Clay St., La Porte, Ind. 46350

Filed Apr. 24, 1975, Ser. No. 571,490
Int. Cl.² A01D 35/262
U.S. Cl. 56—17.5 6 Claims



1. A self cleaning power driven rotary lawn mower and deck assembly in which grass clippings and debris sticking to the underside of the deck assembly are removed solely by the rotating action of the lawn mower blade comprising:

a blade having a central mounting opening;

metal pins each having a head and a shank projecting towards said deck mounted on opposite sides of the central opening which mounts the blade on the power motor of the mower to permit balanced rotation of said blade;

flexible mounting means on said blade at the base of said pins for securing the pins to said blade;

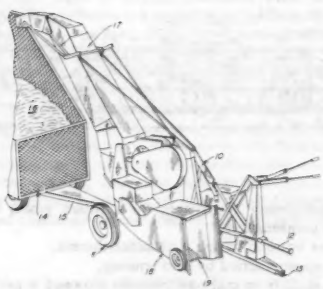
said flexible mounting means including a cap surrounding said head, an elastic grommet in said cap, and an opening permitting whip movement of the shank to about 15° on each side of the normal perpendicular extension of said shank; and,

the tip of said shank extending to about ¼ inch from the underside of said deck whereby whipping movement at the shank ends removes the debris from the deck;

3,959,956
COTTON HARVESTING MACHINE

Lambuth G. Fowler, 2506 46th St., Lubbock, Tex. 79417

Filed Sept. 27, 1974, Ser. No. 509,788
Int. Cl.² A01D 46/10
U.S. Cl. 56—30 2 Claims



1. A cotton harvesting machine comprising

a. a wheel bearing supporting frame embodying

1. a cotton stripping unit;

2. a main cotton discharging outlet duct for discharging cotton from the machine into a pick-up or loader wagon and including

a. an upper and outlet end portion; and

b. a downwardly extending lower end portion;

3. a first and primary high velocity air stream duct for discharging a first and primary high velocity air stream upwardly into the said lower end portion of the said main cotton discharging outlet duct and including a lower end portion;

4. a fan housing including a body having a portion opening upwardly into and having communication with the said lower end portion of the said first and primary high velocity air stream duct and including a downwardly extending portion opening downwardly from said body of the said fan housing;

5. a combination separation chamber and auxiliary high velocity air stream duct having

a. an upwardly extending portion extending upwardly and having communication with the said lower end portion of the said main cotton discharge outlet duct; and including

1. a downwardly extending lower end portion;

6. an auxiliary high velocity air stream duct including an upper end portion having communication with the said downwardly extending portion of the said body of the said fan housing and including a lower end portion having communication with the said downwardly extending lower end portion of the said combination separation chamber and auxiliary high velocity air duct for discharging an auxiliary high velocity air stream into the said combination separation chamber and auxiliary high velocity air duct;

7. a high velocity fan rotatably mounted in the said fan housing for creating a high velocity air stream therein for discharge in part into the said first and primary high velocity air stream duct through the said lower end portion thereof and in part downwardly through the said auxiliary high velocity air stream duct into the said combination separation chamber and auxiliary high velocity air stream duct and thence into the said lower end portion of the said main cotton discharge outlet duct;

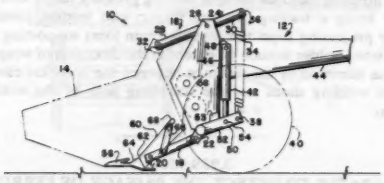
8. means for conveying cotton from the said stripper units into the said combination separation chamber and auxiliary or secondary high velocity air stream duct; and

9. means for rotating the said high velocity air fan.

3,959,957
CROP HARVESTING MACHINE HEADER SUSPENSION SYSTEM

Lawrence M. Halls, New Holland, Pa., assignor to Sperry Rand Corporation, New Holland, Pa.

Filed Jan. 24, 1975, Ser. No. 544,028
Int. Cl.² A01D 47/00
U.S. Cl. 56—208 11 Claims



1. In a crop harvesting machine of the type which includes a mobile frame adapted to move across a field and an elongated crop material harvesting header, an improved pair of assemblies laterally spaced apart along said frame for suspending respective opposite lateral ends of said header from said frame, each of said assemblies comprising:

lower means pivotally mounting a lower portion of one of said opposite lateral ends of said header to a lower portion of said frame;

an elongated arm pivotally mounting an upper portion of one of said opposite lateral ends of said header to an

upper portion of said frame, said arm being pivotally mounted at an intermediate portion thereof on said upper frame portion and having first and second portions on either side of said intermediate portion which respectively extend in general alignment with but in generally opposite directions from the location of pivotal mounting of said arm on said upper frame portion, said first portion of said arm being pivotally connected to said upper portion of said respective one of said opposite lateral ends of said header; and

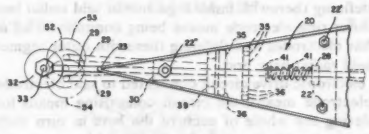
resilient means coupled to said second portion of said arm and extending therefrom generally downwardly and coupled to said lower frame portion so as to counterbalance the weight of said respective one of said opposite lateral ends of said header and thereby support said respective one header opposite lateral end in an operating position relative to the field, while at the same time enable said respective one header opposite lateral end to vertically move relative to the other header opposite lateral end and floatingly follow the contour of the field independently of said other opposite lateral end, as said mobile frame moves across the field.

3,959,958

DEFLECTOR ROLLER APPARATUS

Jacob Bontrager, 809 3rd Ave. N.E., Jamestown, N. Dak. 58401

Filed Apr. 9, 1975, Ser. No. 566,265
Int. Cl.² A01D *63/02*
U.S. Cl. 56—314 **5 Claims**



2. A roller deflector apparatus adapted to be mounted to each forward point of a divider of a header, said apparatus comprising a main plate to be mounted to the point of the divider, a movable rod, movable mounting means for movably mounting said rod to said main plate for permitting movement of said rod with respect to said main plate, spring means returning said rod to its position prior to its movement, said rod having an upwardly extending forward end with a roller rotatably mounted thereon so as to be positioned in front of the point of the divider in spaced relation whereby the header may be driven through a field of sunflower plants to cut and reel the plants with the roller engaging the stems of the sunflower plants as the stems approach engagement with the points, and with the roller movable upon engagement with the stem to cushion the engagement with the roller and to prevent the stem from engaging the point of the divider and to facilitate guiding the stem by the point along the side of the divider without abruptly engaging the stem.

3,959,959

MACHINE FOR VINTAGING GRAPES

Guy Louault, Lavau, and Gerard Louault, St. Fargue, both of France, assignors to S. A. Louault, Saint Fargeau, France

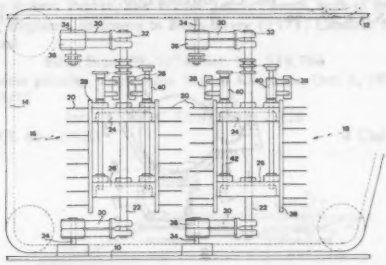
Filed Nov. 7, 1974, Ser. No. 521,613
Claims priority, application France, Nov. 7, 1973, 73.39515
Int. Cl.² A01D *46/00*
U.S. Cl. 56—330 **17 Claims**

1. A machine for vintaging grapes comprising:

a frame adapted to be moved along at least one row of grapevines,

two pairs of cylinders carried by said frame and arranged one pair behind the other with respect to the direction of movement of said frame, the axis of each cylinder being vertical, and the cylinders of each pair being arranged so that one cylinder of each pair is on each side of the row of grapevines when said frame is moved along the row,

support means carried by said frame and supporting said cylinders for free rotation about their axes, said support means permitting movement of the cylinders of each pair toward and away from each other,



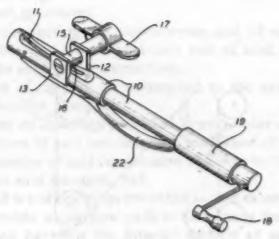
a plurality of substantially vertical rows of resilient rods projecting radially from each of said cylinders, the rods of each row being equidistantly spaced apart for the major portion of the length of each row, and rows of relatively closely spaced apart rods alternating with rows of relatively widely spaced apart rods around the periphery of each cylinder, and means for vibrating said cylinders.

3,959,960

TENSIONING, TWISTING AND CUTTING DEVICE FOR SUTURES

Manuel V. Santos, 126 Pulaski St., Newark, N.J. 07105

Filed Mar. 12, 1975, Ser. No. 557,461
Int. Cl.² B65H *69/06;* **A61B** *17/04*
U.S. Cl. 57—22 **19 Claims**



1. A tensioning, twisting and cutting device for sutures, comprising:

a. an elongate shaft having lumen means, at an end thereof, for passing the sutures through;

b. the shaft having a channel communicating with the lumen means;

c. rotatable spool means, proximate the channel, for winding up the sutures to provide an initial degree of tension;

d. the spool means having a slot to receive the sutures;

e. means for rotating the spool means to wind up the sutures on the spool means;

f. means for twisting the sutures together to provide fixation and a final degree of tension; and

g. cutting means, for cutting the sutures.

3,959,961
APPARATUS FOR REMOVING IMPURITIES FROM FIBROUS MATERIAL

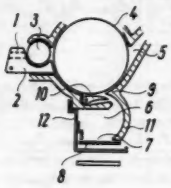
Fritz Stahlecker, Bad Uberkingen, Germany, assignor to Fritz Stahlecker and Hans Stahlecker, both of, Germany

Filed Oct. 25, 1974, Ser. No. 518,153

Claims priority, application Germany, Nov. 2, 1973, 2354967

Int. Cl.² D01H *11/00, 1/12*

U.S. Cl. 57—56 **5 Claims**



1. An apparatus for separating fibrous material supplied to a spinning rotor of an open-end spinning unit, having a path of travel for said separated fibers, in which is located an opening for removing impurities contained in said fibrous material, said opening having a wider area between its inlet and its outlet, and in which a conveying belt means travel past the outlet of said opening for carrying away the impurities.

3,959,962
METHOD OF FORMING A BULKED POLYESTER TEXTILE YARNS

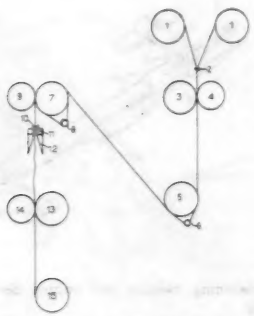
Frank Wilding, Harrogate, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Feb. 21, 1974, Ser. No. 444,598

Claims priority, application United Kingdom, Feb. 23, 1973, 8990/73

Int. Cl.² D02G *3/38, 3/04, 1/16*

U.S. Cl. 57—157 F **9 Claims**



1. A process for the production of a bulked polyester textile yarn comprising forming a bundle composed of 25–75% by weight of (A) potentially crimpable, drawn bicomponent polyester continuous filaments and 75–25% by weight of (B) drawn polyester continuous homofilaments, the filaments (A) having a greater potential shrinkage than filaments (B); and subjecting the filaments of the bundle to the action of an interlacer untilizing jets of heated gaseous medium at a temperature of from 170°C to 250°C while substantially simultaneously allowing the filaments of the bundle to relax.

3,959,963
SOLID-STATE DISPLAY FOR TIME-PIECE

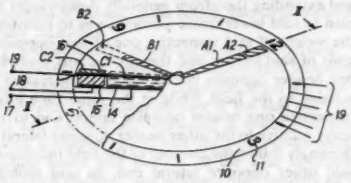
Nicholas John Murrell, 23, The Wynd, Dalgety Bay, Fife, Scotland

Filed Oct. 29, 1974, Ser. No. 518,835

Claims priority, application United Kingdom, Oct. 29, 1973, 50182/73

Int. Cl.² G04B *19/30, 19/06;* H01J *63/04*

U.S. Cl. 58—50 R **7 Claims**



1. A time-piece comprising:

a display having a display layer composed of electrooptical display elements disposed about a central point;

a plurality of bar electrodes on one face of the display layer radiating from the central point of the display and defining segmented radial bars of the display;

inner and outer concentric ring electrode means on the other face of the display layer, the inner ring electrode means being common to all of said bar electrodes and defining therewith inner segments of said radial bars, the outer ring electrode means being common to all of said bar electrodes and defining therewith outer segments of said radial bars; and

an electronic drive circuit connected to said electrodes and electrode means, the circuit comprising means for rendering the whole of each of the bars in turn visible by contrast with the other bars to simulate a minute hand, rendering each of the inner segments in turn visible by contrast with the other inner segments to simulate an hour hand, and rendering each of the outer segments in turn visible by contrast with the other segments to simulate a second hand.

3,959,964
MOUNTING ARRANGEMENT FOR TIMEPIECE COMPONENTS

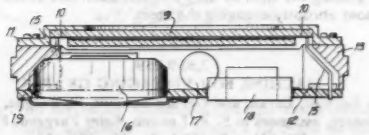
Satoshi Yamazaki, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Continuation-in-part of Ser. No. 384,870, Aug. 1, 1973, abandoned. This application Feb. 10, 1975, Ser. No. 548,714

Claims priority, application Japan, Aug. 3, 1972, 47-77800

Int. Cl.² C04B *19/30;* G04B *29/00, 37/00*

U.S. Cl. 58—50 R **3 Claims**



1. A mounting arrangement for components of an electronic timepiece of the type including, in operative combination, a liquid crystal display panel assembly provided with segments for selectively illuminating a digital display, a power source, a standard time high-frequency oscillator driven by the power source, a divider for dividing the high frequency signal transmitted thereto from the oscillator, and a decoder for translating the divided signals to output signals which are

transmitted to the panel assembly for selectively illuminating segments thereof, the mounting comprising a housing including a cylindrical section having opposed ends and a continuous interior sidewall, a frame releasably connected to one end of the cylindrical section, and a cover connected to the other end thereof, the liquid crystal display panel assembly underlying and being supported by the frame for thereby exposing substantially the entire display surface of the panel assembly through an annulus defined by the frame; the battery, oscillator and decoder being substantially planarly mounted within the housing and on the cover thereof; a conductive plate mounted within the housing on the cover thereof; a plurality of connectors having respective ends mounted in the conductive plate and substantially upstanding thereon, the connectors having respective other ends connected to the panel assembly for transmitting an output signal from the decoder to the panel assembly for thereby illuminating a determined time display, said connectors being arranged between said decoder and the illuminable segments on the display panel; whereby the arrangement of components within the housing is non-overlapping and a flattened timepiece construction is obtained.

3,959,965

METHOD AND APPARATUS FOR WELDING A LINK CHAIN

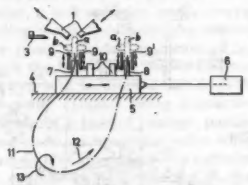
Toni Wüst, Cologne, Germany, assignor to Meyer, Roth & Pastor Maschinenfabrik GmbH, Cologne, Germany

Filed Feb. 20, 1975, Ser. No. 551,323

Claims priority, application Germany, Feb. 25, 1974, 2408930

Int. Cl.² B21L *3/00*

U.S. Cl. 59—31 **7 Claims**



1. A method of welding a link chain of indeterminate length formed of C-shaped, jointed, serially interconnected, alternating first and second links, comprising the following steps for completing the welding of the chain during a single pass:

a. guiding said chain to and through a first welding position;

b. orienting the first and the second chain links in the zone of said first welding position to assume, respectively, an edgewise upright and a flat-lying orientation;

c. successively welding the joint of said first links held in said first welding position;

d. subsequent to the welding of a first link held in said first welding position, advancing the just-welded first link to bring the successive first link into the first welding position;

e. guiding said chain from said first welding position in an arc in a reverse direction to a second welding position for obtaining two juxtapositioned, oppositely oriented chain portions;

f. orienting the first and the second chain links in the zone of said second welding position to assume, respectively, a flat-lying and an edgewise upright orientation;

g. alternately with step (c), successively welding the joint of said second links held in said second welding position;

h. subsequent to the welding of a second link held in said second welding position, advancing the just-welded second link to bring the successive second link into the second welding position; and

i. between two consecutive welding steps, displacing said chain portions transversely to the direction of chain advance for alternately bringing said first and second chain links in a sole welding station where steps (c) and (g) are performed.

3,959,966

GAS TURBINE ENGINE

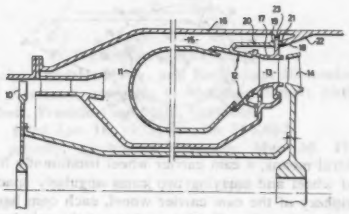
Bryan Robert Pearce, and Walter James Powell, both of Bristol, England, assignors to Rolls-Royce (1971) Limited, England

Filed Sept. 30, 1974, Ser. No. 510,766

Claims priority, application United Kingdom, Oct. 5, 1973, 46753/73

Int. Cl.² F02C *7/20;* **F01D** *25/28*

U.S. Cl. 60—39.32 **4 Claims**



1. A gas turbine engine, comprising: a combustion chamber having an annular outlet duct defined by

radially inner and outer chamber walls; an annular array of vanes having inner and outer shroud rings,

said outer shroud ring having an upstream extremity confronting a downstream extremity of said outer chamber wall;

an extension member extending radially outwardly and axially downstream from said outer chamber wall, said extension member being connected to said outer chamber wall at a junction upstream of said downstream extremity, said extension member having a downstream extremity adjacent a downstream end of said outer shroud ring;

a support structure;

means connecting the downstream end of said extension member and the downstream end of said outer shroud ring to said support structure;

a source of cooling air connected to the exterior of said combustion chamber;

a first set of openings provided in said outer chamber wall upstream of said junction to admit a flow of cooling air to the interior of said combustion chamber to form a cooling film at said junction; and

a second set of openings provided in said extension member to provide an air flow path to said vanes through a space defined between the interior surface of said extension member and the exterior surfaces of said outer chamber wall and said outer shroud ring.

3,959,967

RECIPROCATING APPARATUS PARTICULARLY FOR PUMP UNIT

Joël Chardonneau, Nantes, and Claude Sablé, Reze, both of France, assignors to Centre d'Etudes et de Realisations Industrielles de l'Atlantique C.E.R.I.A., Nantes, France

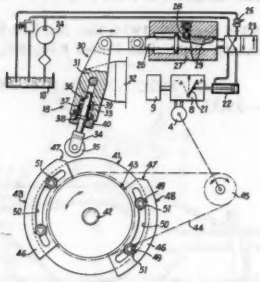
Filed June 6, 1975, Ser. No. 584,285

Int. Cl.² F16H *39/46*

U.S. Cl. 60—382 **13 Claims**

1. Apparatus for maintaining a permanent reciprocating movement of a mechanical arrangement, particularly a pump unit, comprising a wheel coupled to the mechanical arrange-

ment and fastened on the shaft of a hydraulic motor which is fed by a variable delivery pump provided with an adjusting element which, through a change of position, effects the reversal of delivery of the said pump control means operatively connected to said pump for effecting reversal of the pump delivery, the apparatus comprising in addition a drive mechanism for coupling the said adjusting element to the said wheel, the said drive mechanism comprising a mechanical transmission mechanism containing a rocking lever coupled to the said



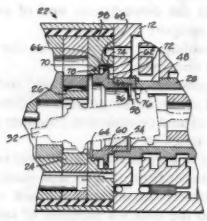
control means, a cam carrier wheel rotationally fixed to the said wheel and carrying two cams angularly spaced on the periphery of the cam carrier wheel, each cam having an inclined surface for effecting rocking of the said lever respectively to one or the other of its positions, and a circular surface for maintaining the lever in its rocked position for a certain period of time after the rocking, a resilient device being provided which is connected between the said lever and the said cam carrier wheel in order to keep the lever and the cams coupled during the aforesaid period of time.

3,959,968

STEERING VALVE WITH LINEAR SPOOL DAMPENING

Jonny R. Greiner, Phoenix, Ariz., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Apr. 25, 1975, Ser. No. 571,871
Int. Cl.² F15B 9/08
U.S. Cl. 60—384 **6 Claims**



1. In a fluid controller for a power steering system including a housing having a fluid inlet for connection to the discharge side of a fluid pump, an outlet for connection to the suction side of the fluid pump and a pair of ports for connection to the opposite sides of a dual acting hydraulic device such as a balanced cylinder of the power steering system for controlling the flow of pressurized fluid to the device, a gear set which serves as a fluid meter or as a manual pump, depending upon the operativeness of the fluid pump, a spool valve shiftable axially to control the flow through the inlet, the gear set, the cylinder ports and the outlet, a control shaft mounted for rotation on the housing responsive to movement of a steering wheel and coupled to the spool valve for effecting axial shifting of the spool valve in response to rotation of the control shaft, a wobble shaft passing from the interior of the spool valve to the gear set and a bearing plate through which the wobble shaft passes intermediate the gear set and the spool valve, the improvement comprising:

a member extending from an end of said spool valve adjacent said bearing plate;

a fluid filled cylindrical dash pot cavity formed in said bearing plate on a spool valve side thereof positioned to receive said member; and

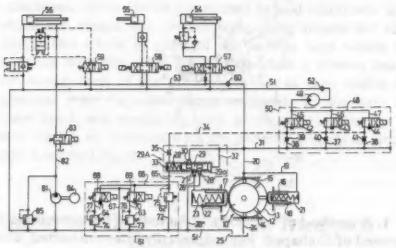
restricted flow means through which said fluid is forced responsive to axial movement of said spool valve thereby preventing overshoot of said spool valve responsive to rotation of said control shaft and resulting vibratory instability by said power steering system.

3,959,969

APPARATUS FOR REGULATING THE PRESSURE AND RATE OF FLOW OF FLUID SUPPLIED BY A VARIABLE-DELIVERY PUMP

Egon Tittmann, Leonberg, and Heinz Walter, Rutesheim, both of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Mar. 17, 1975, Ser. No. 559,361
Claims priority, application Germany, Mar. 20, 1974, 2413295
Int. Cl.² F16H 39/46; F15B 11/16
U.S. Cl. 60—445 **22 Claims**



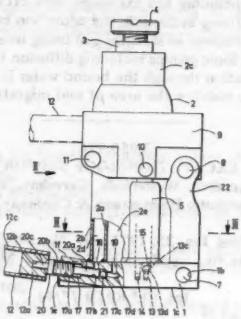
1. Apparatus for regulating the rate of flow and the pressure of fluid which is supplied by the outlet of a variable-delivery pump to at least one first and at least one second consumer and wherein the rate of delivery is adjustable by two fluid-operated motors one of which is controlled by an adjustable regulating valve connected with said outlet and having a valve member movable between a plurality of positions, comprising a plurality of normally closed pressure reducing pilot valves for said regulating valve, said pilot valves being arranged to control the pressure of fluid which is supplied to said first consumer and to open in response to different fluid pressures to thereby change the position of said valve member and the delivery rate of said pump through the medium of said motors; means for selectively connecting at least one of said pilot valves to said regulating valve; a plurality of flow restrictors each providing a discrete path of the flow of fluid from said outlet to said second consumer; and shutoff valves provided in said paths, each of said shutoff valves being actuatable to allow fluid to flow along the respective path to said second consumer via the associated flow restrictor.

3,959,970

HYDRAULIC JACK

Karel Bos, Brasschaat, Belgium, and Hendrik Smit, Pretoria, South Africa, assignors to Scambia Industrial Developments AG, Liechtenstein

Filed Apr. 21, 1975, Ser. No. 569,768
Claims priority, application Switzerland, Apr. 25, 1974, 5664/74
Int. Cl.² F15B 15/18
U.S. Cl. 60—477 11 Claims



1. A hydraulic jack with a base plate, on which are attached a pump cylinder, a jack cylinder, and a reservoir concentrically surrounding the jack cylinder, the reservoir being connected to the pump cylinder by means of a first passage, passing through the base plate, and a first nonreturn valve which enables hydraulic medium to flow from the reservoir on pumping, the pump cylinder being connected to the jack cylinder by means of a second passage, passing through the base plate, and a second nonreturn valve which enables hydraulic medium to flow from the pump cylinder on pumping, and the jack cylinder being connected to the reservoir by means of a relief passage and a blocking member including an adjustable bolt, wherein the adjustable bolt is guided in a blocking bore situated in the base plate, which bore has a section formed as blocking seat and which bore, on one side of this seat, has a section which is connected by means of a first connection bore to the reservoir and on the other side of this seat, has a section which is connected by means of a second connection bore to the jack cylinder, wherein the blocking bore rises towards the edge of the base plate, and wherein the base plate consists of a rolled material and, in the region of an outer end section of the blocking bore, has an indentation stretching substantially to the outer wall of the reservoir and produced by forming, whereby the rolled material in the region of the indentation is of substantially the same thickness as in the remainder of the base plate.

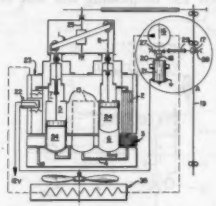
3,959,971

COOLING SYSTEM

Milad H. Mekari, 17250 Raupp Road, Apt. 17B, Melvindale, Mich. 48122

Filed July 22, 1974, Ser. No. 490,224
Int. Cl.² F01K 13/92
U.S. Cl. 60—517 6 Claims

1. The method of cooling the roll sock seals of a Stirling type external combustion engine having a main coolant system with a main water pump which comprises running the main water pump of the engine at a reduced rate of speed after the engine has stopped to force coolant in said main system to circulate in heat transfer relationship with said roll sock seals



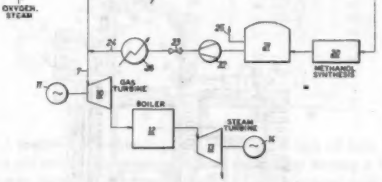
until the temperature of the coolant in said main system drops to a preselected level.

3,959,972

POWER PLANT PROCESS

Paul Rudolph, Bad Homburg, and Emil Supp, Dietzenbach, both of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany

Filed Apr. 10, 1975, Ser. No. 566,862
Claims priority, application Germany, May 30, 1974, 2425939
Int. Cl.² F01K 25/14, 13/00
U.S. Cl. 60—651 4 Claims



1. Power plant process which comprises gasifying fossil fuels by treatment under superatmospheric pressure with oxygen-containing gasifying agents to produce a primary gas which contains carbon monoxide and hydrogen, desulfurizing said primary gas, converting an increasing proportion of desulfurized primary gas into methanol for storage as the load on the power plant decreases, and utilizing an increasing proportion of stored methanol in addition to desulfurized primary gas in the power plant as the load on the power plant increases.

3,959,973

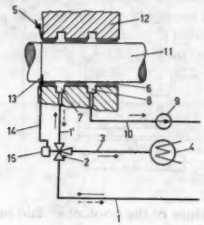
APPARATUS FOR CONTROLLING STEAM BLOCKING AT STUFFING BOXES FOR STEAM TURBINE SHAFTING

Pierre Meylan, Neuenhof, Switzerland, assignor to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed Apr. 16, 1975, Ser. No. 568,571
Claims priority, application Switzerland, May 22, 1974, 7037/74
Int. Cl.² F01K 13/00
U.S. Cl. 60—657 8 Claims

1. In a steam turbine structure wherein a stuffing box is provided for the rotor shaft at the pass-through opening in the turbine casing and blocking steam is admitted to the stuffing box, the improvement where, in order to prevent thermal-shock damage to the shaft at the stuffing box during a re-start of the turbine while the shaft temperature is still at approximately its normal operating temperature and while the block-

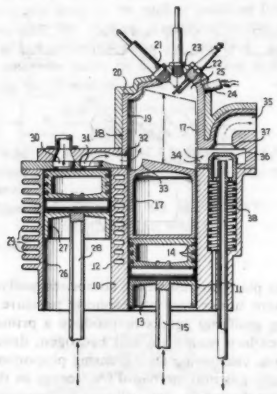
ing steam is still in a wet state, means are provided for preventing the wet steam from reaching the stuffing box, said means including a controllable valve in the line of the blocking steam to the stuffing box for by-passing the wet steam to a condenser, said valve means being actuated after the blocking steam has reached its dry state to close off the by-pass to said condenser and open the blocking steam line to the stuffing box.



3,959,974
INTERNAL COMBUSTION ENGINE

Luther B. Thomas, 153 Herndon Ave., Shreveport, La. 71101

Filed Sept. 19, 1974, Ser. No. 507,555
Int. Cl.² F01B *29/04*
U.S. Cl. 60—712 **6 Claims**



1. An internal combustion engine comprising a power cylinder having an upper high temperature portion and a lower relatively low temperature portion, a power piston within the power cylinder including an upper displacement portion for operation in said upper high temperature cylinder portion and being ringless and sized for relatively large clearance within the power cylinder, said power piston also including a ringed portion below said upper displacement portion and operating within said lower relatively low temperature portion of the power cylinder, means for feeding charges of pressurized air to the interior of the power cylinder above said displacement portion of the power piston and for cyclically exhausting the power cylinder, fuel injection means on the top portion of the power cylinder to inject fuel therein when the displacement portion of the power piston is within said upper high temperature portion of the power cylinder, and water injection means on the power cylinder to inject water into the top of the upper high temperature cylinder portion alternately with injections of fuel therein when the combustion chamber is sufficiently hot to produce super-heated steam.

3,959,975
SOIL STABILIZATION BY ION DIFFUSION

Edward D. Graf, 1680 Bryant St., Daly City, Calif. 94015

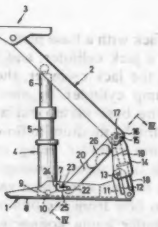
Continuation-in-part of Ser. No. 75,749, Sept. 25, 1970, abandoned. This application Sept. 18, 1972, Ser. No. 290,027
Int. Cl.² E02D *3/14*
U.S. Cl. 61—36 C **13 Claims**

1. In a process for stabilizing a clay containing soil wherein a chemical composition is distributed through said soil, the improvement comprising adding an aqueous concentrate to cavities in said soil, said concentrate containing about 15% or more on a weight basis of at least one water soluble, ionizable salt, the solubilized form of which provides soil strengthening ionic groups of the type that stabilize the soil particles by mechanisms including ion exchange with exchangeable ions naturally occurring in the soil, the active ion being present in an amount sufficient to stabilize soil being treated, the distribution of said ionic groups including diffusion through the soil by ionic migration through the bound water in said clay containing soil to stabilize the area of said migration.

3,959,976
EXCAVATION-ROOF SUPPORT

Günter Blumenthal, Westerholt, Germany, assignor to Bochumer Eisenhutte Heintzmann & Company, Bochum, Germany

Filed Jan. 23, 1975, Ser. No. 543,369
Claims priority, application Germany, Mar. 21, 1974, 2413538
Int. Cl.² E21D *15/44*
U.S. Cl. 61—45 D **10 Claims**



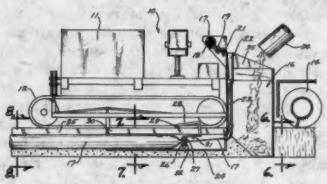
1. A roof support for use in underground excavations of different roof heights, comprising a base having one side facing towards and another side facing away from a face of the excavation; a shield having a first end portion spaced from and another end portion adjacent said other side, and extending upwardly of said base; a roof support cap mounted on said first end portion of said shield; means for connecting said second end portion of said shield to said base, including at least one guide member and at least one support member each having a first portion remote from and a second portion at said base, a pivot shaft mounted on said first portions of said members and articulating the same to one another, and means for mounting said second portions of said members on said base for pivoting about spaced axes, and at least one of said second portions for selective displacement relative to said base to thereby change the position of said pivot shaft with respect to said base, said second end portion of said shield being supported on said pivot shaft so that said displacement of the latter results in commensurate displacement of the former, and for pivoting about said pivot shaft; means for pivoting said shield about said pivot shaft and including a pit prop extending between and engaging said base and said shield; and means for selectively infinitely displacing said pivot shaft with respect to said base in dependence on the instantaneous roof height so as to maintain said cap in engagement with the roof close to the face of the excavation for each instantaneous roof height.

3,959,977

CONCRETE SLIP FORMING APPARATUS

Harold W. Godbersen, Ida Grove, Iowa 51445

Filed Oct. 21, 1974, Ser. No. 516,756
Int. Cl.² E03F 3/06
U.S. Cl. 61—63 11 Claims



1. Apparatus for forming elongated hollow concrete structures comprising:

an elongated flexible tube;

a source of pressure sealingly connected to the interior of said tube;

means holding another portion of said tube substantially closed at all times to thereby cause a section of the tube to be inflated;

form means extending over a portion of said tube said form means including a tubular shaped section, said flexible tube having a portion of its inflated length disposed in said tubular shaped section and conforming to the interior shape of said tubular shaped section, said holding means being attached to said form means;

means connected to the form means for continuously supplying concrete in a plastic condition to said form means;

means connected to said form means for moving said form means along said tube to thereby shape the concrete; and

means connected to said concrete supplying means for providing a continuous supply of flexible tubing to said tubular shaped section of said form means including a roll of flattened flexible tubing and means for guiding said flattened flexible tubing to said holding means, said guiding means comprising a conduit connected at one end thereof to a funnelling means for funnelling said flattened flexible tubing into a rolled shape into said conduit, the other end of said conduit being connected to one end of said tubular shaped section of said form means to thereby guide said flexible material to said holding means.

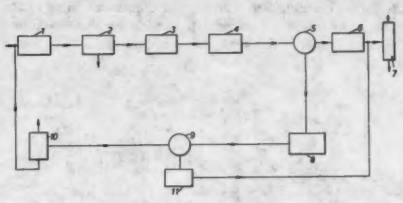
3,959,978

SEPARATION PROCESS BY FRACTIONAL CRYSTALLIZATION

John Lindley, and Andrew John McLeod, both of Stockton-on-Tees, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Apr. 25, 1972, Ser. No. 247,304
Claims priority, application United Kingdom, Apr. 30, 1971, 12337/71
Int. Cl.² B01D 9/04
U.S. Cl. 62—58 9 Claims

1. A process in which paraxylene is separated from a solution comprising paraxylene and at least one other xylene, ethyl benzene, or a mixture of at least one other xylene and ethyl benzene by chilling the solution to a temperature in the range of −30° to −10°C to crystallise part of the paraxylene, separating crystals of the paraxylene from the mother liquor, washing the separated crystals with a wash liquid, chilling the mother liquid in the presence of at least part of the wash liquid to a temperature in the range of −40° to −60°C to produce further crystals of the paraxylene, separating such further crystals of the paraxylene from the mother liquor, washing the crystals



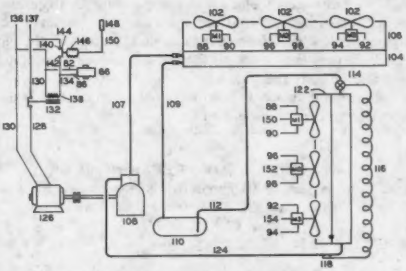
thus separated with the wash liquid and separating wash liquid from the separated paraxylene.

3,959,979

DUAL VOLTAGE FORCED AIR HEAT EXCHANGER

Daniel E. Kramer, 2009 Woodland Drive, Yardley, Pa. 19067

Continuation-in-part of Ser. Nos. 205,065, Dec. 6, 1971, Pat. No. 3,853,174, and Ser. No. 401,265, Sept. 27, 1973, Pat. No. 3,877,243. This application Dec. 9, 1974, Ser. No. 531,228
Int. Cl.² F25D 17/06
U.S. Cl. 62—89 5 Claims



1. A method of achieving two speed operation of fans in a forced air heat exchanger, said heat exchanger having a heat exchange element; fans positioned to move air over said element; alternating current motors adapted to drive said fans, said motors being of the type which operate at higher voltage, higher speed, lower voltage, lower speed; said motors having first power connection means and second power connection means; a common connection; multipole switch means having a first and a second position, said switch means being connected to the common connection, wherein the method comprises providing a poly-phase power supply having at least 3 conductors; connecting the conductors to the switch means; essentially equally distributing connection of first power connection means among at least two conductors; actuating the switch means to connect the second power connection means alternately to the conductors, causing the motors to operate at higher voltage, higher speed; and to the common, causing the motors to operate at lower voltage, lower speed.

3,959,980

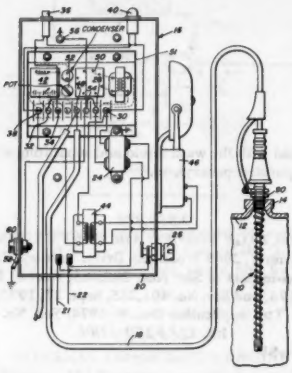
REFRIGERANT MOISTURE DETECTION SYSTEM

Samuel L. Hamilton, 3800 NW. 22nd Ave., Miami, Fla. 33142

Continuation-in-part of Ser. No. 340,373, March 12, 1973, Pat. No. 3,846,730. This application Nov. 5, 1974, Ser. No. 521,234
Int. Cl.² F25B 49/00
U.S. Cl. 62—126 8 Claims

1. A refrigerant moisture detection system comprising a visual signal means, an audio signal means and a sensing device positionable in a refrigerant flow path for detecting the

presence of absorbed moisture and moisture related contaminants in the refrigerant, said sensing device including an anode and cathode disposed in spaced relation in the flow path and electrically connected to a source of electrical energy, absorbent means disposed between the anode and cathode and in the flow path with the absorbent means including material



capable of change of electrical conductivity in response to moisture absorption, amplifier means and relay means electrically connected with the sensing device to sense the change in electric current flow through the sensing device to produce a signal and amplify the signal to operate a relay for energizing the visual signal means and audio signal means and shut down the refrigeration equipment prior to damage.

3,959,981

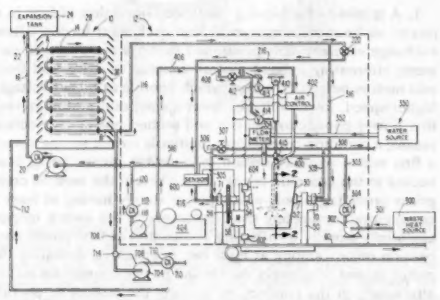
APPARATUS FOR PREPARING ICE

Luzon L. Anderson, 257 Merwin Drive, Norristown, Pa. 19401

Filed Aug. 8, 1974, Ser. No. 495,685

Int. Cl.² F25C *1/10*

U.S. Cl. 62—135 **4 Claims**



2. An apparatus for making ice under atmospheric conditions, comprising in combination:

a. refrigeration means exposed to the atmosphere and coacting therewith to utilize atmospheric conditions for reducing the temperature of a refrigerant to atmospheric temperature;

b. a container having a jacket and an opening for the discharge of ice formed within the container;

c. water input means for introducing water into the container at controlled conditions;

d. refrigerant circulation means connected to said refrigeration means and to said jacket for circulating refrigerant through the jacket to cause water in said container to freeze into ice; and

e. ice discharge means for effecting the discharge of ice from said container, comprising release means for releasing the ice from the container and positioning means for positioning the jacketed container so that the released ice will fall by gravity from the container, said positioning means comprising pivotal means attached to the container to allow it to be pivoted through an arc from an upright position to the position wherein the ice can be discharged by gravity; and motor means are provided for pivoting the container as aforesaid, said motor means being controlled automatically by sensor means which senses when the ice within the container is formed; said sensor means, motor means and positioning means coacting to return the container to an upright position for refilling by said water input means, said water input means and said sensor means coacting to introduce water into said container when said container is in the upright position, to stop the flow of water during the freezing thereof in the container and during the time when the ice is being discharged from the container, and to automatically introduce water into the container when it has again been moved to the upright position.

4. An apparatus for making ice under atmospheric conditions, comprising in combination:

a. refrigeration means exposed to the atmosphere and coacting therewith to utilize atmospheric conditions for reducing the temperature of a refrigerant to atmospheric temperature;

b. a container having a jacket and an opening for the discharge of ice formed within the container;

c. water input means for introducing water into the container at controlled conditions;

d. refrigerant circulation means connected to said refrigeration means and to said jacket for circulating refrigerant through the jacket to cause water in said container to freeze into ice; and

e. ice discharge means for effecting the discharge of ice from said container, comprising warm refrigerant means connected to the jacket of said container to introduce warm refrigerant under controlled conditions into said jacket and thereby cause the temperature of the container to rise to a point wherein the ice will part from the container so that it is released and can be discharged therefrom; and mounting means are provided connected to said container for supporting the container in an upright position with the opening at the top and for allowing the container to be pivoted to a position which will allow ice to be discharged therefrom under the influence of gravity; said mounting means having passages therethrough in fluid flow communication with said jacket; and said refrigeration means and said warm refrigerant means are connected to said passage means in said mounting means for introduction of refrigerant therethrough to the jacket of said container; said connections being such that refrigerant at atmospheric temperature can pass through said mounting means and said jacket in the upright position of said container and upon movement of said container to the position wherein said ice can be discharged therefrom by gravity, warm refrigerant can be introduced through said mounting means and into the jacekt of said container.

3,959,982

REFRIGERATION UNIT

Joseph Herbert Denis, 75 Lawrence Ave., Inwood, N.Y. 11696, and Abraham J. Rodolitz, 40 Neptune Ave., Woodmere, N.Y. 11598

Filed Nov. 1, 1974, Ser. No. 519,931

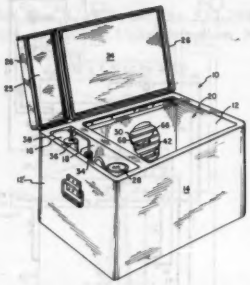
Int. Cl.² F25B *41/04*

U.S. Cl. 62—223 **8 Claims**

1. A portable unit including a compartment adapted to be used for refrigeration comprising:

a primary evaporator located within the compartment having an inlet and an outlet, said primary evaporator adapted to receive liquid refrigerant which at least partially evaporates therein and thereby withdraws heat from and cools the compartment;

conduit means including pressure reducing means, having one end connected to the inlet of said primary evaporator, the other end being connectable to a source of pressurized liquid refrigerant;



a secondary evaporator located within the same said compartment having an inlet and an outlet, said secondary evaporator adapted to receive liquid refrigerant which evaporates therein and thereby cools said compartment; and

phase separator means fluidly communicating with the outlet of said primary evaporator for receiving said at least partially evaporated refrigerant and venting the gaseous phase thereof to the atmosphere and fluidly communicating with the inlet of said secondary evaporator for directing the liquid phase of the refrigerant to the secondary evaporator.

3,959,983

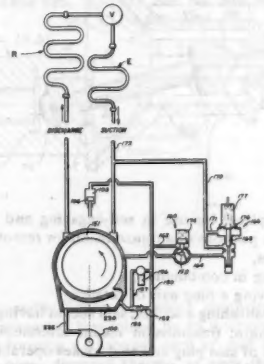
VARIABLE CAPACITY WOBBLE PLATE COMPRESSOR

Richard W. Roberts, Lombard, and Ralph D. Salle, Lake Zurich, both of Ill., assignors to Borg-Warner Corporation, Chicago, Ill.

Division of Ser. No. 347,759, April 4, 1973, Pat. No. 3,861,829. This application Nov. 5, 1974, Ser. No. 521,012

Int. Cl.² F25B *31/00*

U.S. Cl. 62—226 **6 Claims**



1. In an air conditioning apparatus of the type including a condenser, an evaporator and a compressor connected to provide a closed circuit, compression-condensing-evaporation refrigeration system, said compressor comprising means defining a plurality of refrigerant gas working spaces each having a piston cooperating with suction and discharge ports to compress a fluid therein; a drive shaft; a wobble plate driven by said drive shaft in a nutating path about the drive shaft axis; means operably connected between said wobble plate and the individual pistons to impart reciprocating drive to said pistons, the length of stroke being a function of the angle at which said wobble plate is supported relative to the drive axis; means for pivoting said wobble plate at a point spaced from said drive axis so as to permit said wobble plate to be inclined relative to a plane normal to said drive shaft axis, so that when the wobble plate is disposed in said normal plane, the pistons are located at top-dead-center within said gas working spaces; said pistons being enclosed in a fluid tight housing providing a crankcase which is pressurized by fluid bypassing said pistons from said gas working spaces; and means for controlling the pressure within said crankcase including means for sensing pressure of fluid in said evaporator.

3,959,984

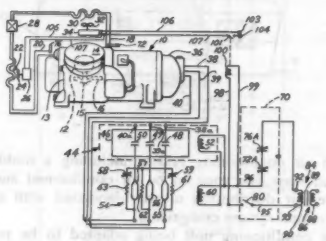
MOTOR PROTECTION APPARATUS USING FUSIBLE LINKS

Robert Vlasak, Toledo, Iowa, assignor to Lennox Industries Inc., Marshalltown, Iowa

Filed Nov. 29, 1974, Ser. No. 528,273

Int. Cl.² H02H *5/04*; F25B *49/00*

U.S. Cl. 62—229 **6 Claims**



1. In a refrigerant compressor of the type having a compression mechanism for receiving a refrigerant gas from a suction line, compressing the refrigerant gas and discharging the compressed refrigerant gas, a motor for operating the compression mechanism and conductor means comprising a first, second and third conductor for applying three-phase electrical power to the motor, improved apparatus for protecting the compressor motor comprising in combination:

first switch means comprising a magnetic contactor connected in series with the conductor means, said switch means being movable between an open position and a closed position;

fusible link means connected in series with the first switch means, said fusible link means being normally in a closed circuit condition and being switchable to an open circuit condition in response to a range of temperatures greater than a predetermined temperature, said fusible line means comprising a first link connected in series with the first conductor, a second link connected in series with the second conductor and a third link connected in series with the third conductor;

heater means comprising a first and second resistor connected in series between the first and second conductors and a third resistor operatively connected between the junction of the first and second resistors and the third conductor and being in heat transfer relationship with the fusible link means;

first operating means comprising first coil means for generating a magnetic field capable of operating the magnetic

contactor for moving the first switch means to the closed position in response to a pilot signal and for opening the first switch means in the absence of the pilot signal;

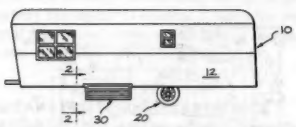
generating means for generating the pilot signal in response to a demand for operation of the compressor; and

second operating means responsive to the closed position of the first switch means and the absense of the pilot signal and comprising a relay responsive to the pilot signal for generating a magnetic field capable of opening normally closed relay contacts connected to the heater means for enabling the heating means to receive electrical power so that the fusible link means is heated to the predetermined temperature, whereby the motor is disconnected from the electrical power, said relay contacts comprising a first contact connected between the first and second resistors and a second contact connected between the second and third resistors.

3,959,985
AIR CONDITIONING SYSTEM FOR A MOBILE HOME INCLUDING AN INTERLOCK

James L. Schulze, Sr., Middletown, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Feb. 18, 1975, Ser. No. 550,563
Int. Cl.² B60H 3/04
U.S. Cl. 62—239 7 Claims



1. An air conditioning system including a mobile home having at least one zone to be air conditioned and a base structure, air distribution means associated with said base structure, said system comprising:

an air conditioning unit being adapted to be removably attached to said mobile home including a cabinet having air moving means, air delivery and air return outlets, and a service area adjacent said air return outlet;

said air distribution means including at least one air inlet for receiving air from said air conditioning unit and air outlet for delivering air into said mobile home zone;

mounting means attached to said base structure for removably receiving said air conditioning unit including a first opening aligned with said air conditioning air delivery outlet and a second opening in alignment with said unit's air return outlet when said unit is located in said mounting means;

air communicating means including a first passageway connecting said first opening and with said air distribution means for delivering air into said mobile home and a second passageway for connecting said second opening with said mobile home interior so that said air moving means recirculates air through said mobile home;

electric power supply means associated with said mobile home including electric plug connector means positioned in said second passageway;

electric receptacle connector means in said service area;

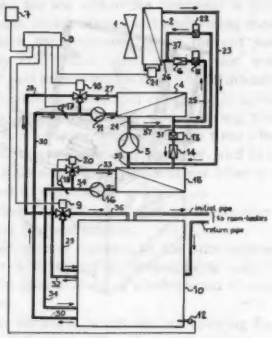
said mounting means including an opening arranged for access from said second passageway being in alignment with said electric receptacle connector when said air conditioner is located in said mounting means; and

said electric connector plug extending through said opening in said mounting means for insertion into said electric receptacle connector to prevent movement of said air conditioner relative to said mounting means.

3,959,986
HEAT-PUMP SYSTEM FOR HOT-WATER ROOM-HEATING

Hugo Ledermann, Glarnischstrasse 30, Stafa, Switzerland

Filed Oct. 15, 1974, Ser. No. 515,077
Claims priority, application Switzerland, Oct. 16, 1973, 14653/73
Int. Cl.² F25B 13/00
U.S. Cl. 62—324 8 Claims

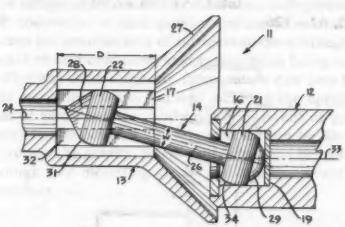


1. A heat-pump system for room heating by hot water, using the external atmospheric air as a source of heat, comprising an air cooler operating as an evaporator, a compressor connected to said air cooler, a condenser connected to said compressor, a hot-water storage vessel and room-heaters supplied thereby, and an evaporator operating as a water cooler for cooling water from said storage vessel, characterized in that the water in said storage vessel is heated, and that with heat, which is withdrawn from the external air by said air cooler, is supplied by said compressor and said condenser to the water, circulating through said storage vessel.

3,959,987
SELF-ENGAGING AND ALIGNING SHAFT COUPLING

Robert B. Garey, San Jose, Calif., assignor to Subsea Equipment Associates Limited, Hamilton, Bermuda

Filed May 8, 1974, Ser. No. 467,879
Int. Cl.² F16D 3/02
U.S. Cl. 64—8 10 Claims



1. A coupling, for use in self-engaging and subsequently aligning two portions of a transmission for remote coupling of said portions,

comprising in combination;

a plug having a plug axis of rotation;

means establishing a socket, said socket having a socket axis of rotation; transmission means intermediate the front portion of said plug and said socket operable for interengaging said plug and socket for torque transmission therebetween when said front portion of said plug is disposed in said socket irrespective of whether said axes are

aligned, or non-aligned at an acute angle relative to each other, and

guide means in the form of a guiding funnel extending beyond said socket operable for guiding the front portion of said plug towards the socket when there is a relatively large non-alignment between the plug and socket axes.

3,959,988

FLEXIBLE COUPLING

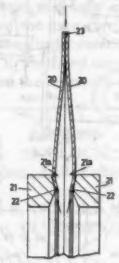
Anthony McNamee, 63, St. James Road, Prescot, Lancashire, England

Filed Nov. 8, 1974, Ser. No. 522,208

Claims priority, application United Kingdom, Nov. 8, 1973, 52091/73

Int. Cl.² F16D 3/52

U.S. Cl. 64—15 B **20 Claims**



1. A flexible shaft coupling comprising a plurality of concave annular diaphragms of sheet metal, each of substantially constant and equal thickness in radial cross-section, arranged in series upon a common axis with their concavities alternately facing in opposite axial directions and with adjacent diaphragms joined together by substantially continuous circumferential electron beam welds at their radially inner and outer margins, respectively, and means joined by substantially continuous circumferential electron beam welds to the radially inner or outer margin, respectively, of those diaphragms which are at each axial end of the plurality for connecting the coupling to respective shafts.

3,959,989

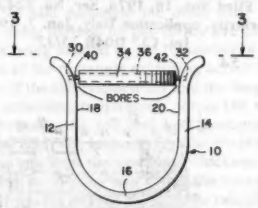
RING HAVING ADJUSTABLY MOUNTED RAPIDLY ROTATABLE INDICIA-BEARING MEMBER

B. S. Bhandia, Daly City, Calif., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Feb. 10, 1975, Ser. No. 548,261

Int. Cl.² A44C 9/02

U.S. Cl. 63—15.65 **2 Claims**



1. An adjustable finger ring which comprises a member having two elongated legs joined by an intermediate arcuate section and forming a U-shape, each of said legs having a plurality of bores disposed therein, at ends thereof remote from said section, each said bore of one leg being disposed in coaxial relationship with a said bore of the other leg thereby forming a plurality of pairs of coaxial bores, an elongated pin having axial extremities removably disposed in one pair of said bores, a generally planar member having oppositely facing surfaces carried on said pin and mounted for rotation about the axis thereof, said generally planar member having indicia on both said surfaces, said indicia being apparently simultaneously visible when said generally planar member is rapidly rotated about the axis of said pin, said legs, section and planar member forming the finger receiving opening of said ring, said opening being adjustable in size by means of said plurality of bores.

3,959,990

ASSEMBLY FOR MOUNTING AN ELECTRIC MOTOR ON A GEARBOX

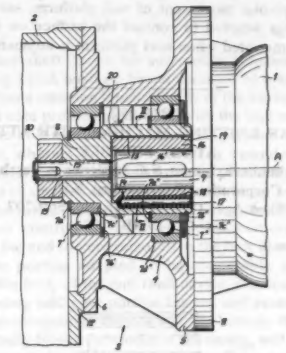
Friederich Gölitz, Wuppertal, Germany, assignor to Maschinenfabrik Ernst Thielenhaus, Wuppertal-Barmen, Germany

Filed Sept. 23, 1974, Ser. No. 508,694

Claims priority, application Germany, Sept. 21, 1973, 2347523; Jan. 17, 1974, 2402067

Int. Cl.² F16D 3/14

U.S. Cl. 64—27 NM **7 Claims**



1. An assembly for connecting an output shaft of a motor or the like to the input of a gearbox or the like, said assembly comprising:

a rigid housing having on one side a motor flange securable to said motor and on the other side a gearbox flange securable to said gearbox;

a rigid connecting body journaled in said housing and rotatable therein about an axis extending between said sides, said connecting body having one end turned toward said gearbox and provided with a pinion connected to said input thereof and another end turned toward said motor and having an axial bore;

a sleeve keyed to said shaft and received with clearance in said bore, said sleeve and the wall of said bore being formed with angularly spaced pairs of mutually confronting axially extending recesses;

a respective elastically deformable pin received in each pair of recesses and bridging the recesses of each pair for rotataionally interconnecting said sleeve and said body, each of said pins including an elongated steel core received with clearance between the recesses of the respective pair and an elastomeric sheath covering the respective core; and

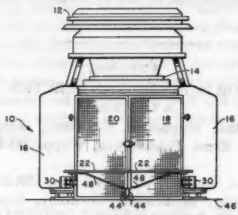
a respective device in said housing mechanically controlling relative displacement of said housing and said body, said device having respective parts connected to said housing and body.

3,959,991

CIRCULAR KNITTING MACHINE WITH CANTILEVERED, PIVOTALLY MOUNTED PLATFORM

Robert Saul Brown, Spartanburg, S.C., assignor to Deering Milliken Research Corporation, Spartanburg, S.C.

Filed Apr. 16, 1975, Ser. No. 568,669
Int. Cl.² D04B 9/00
U.S. Cl. 66—8 4 Claims



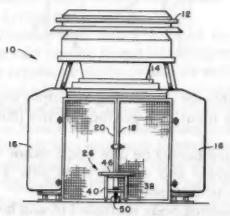
1. A circular knitting machine having a frame and a means to knit a circular fabric comprising: a platform pivotally mounted to said frame substantially perpendicular to the vertical axis of said knitting machine and means to allow horizontal pivotal movement of said platform, said platform including legs adapted to contact the surface on which said machine is mounted when said platform is adjacent said machine.

3,959,992

CIRCULAR KNITTING MACHINE WITH ATTACHED STOOL MEMBER

Paul W. Eschenbach, Inman, S.C., assignor to Deering Milliken Research Corporation, Spartanburg, S.C.

Filed Apr. 18, 1975, Ser. No. 569,207
Int. Cl.² D04B 9/003n
U.S. Cl. 66—8 7 Claims



1. A circular knitting machine having a frame and a means to knit a fabric comprising: door means pivotally connected to said frame to permit access to the interior of said machine and a stool means connected to said door means which moves with said door means when said door means is pivoted.

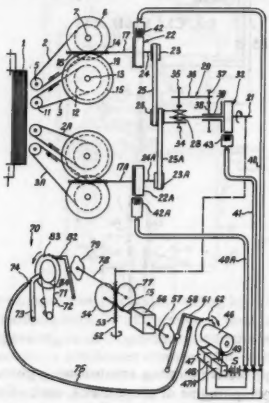
3,959,993

CIRCULAR PILE FABRIC KNITTING MACHINES

Antoine Gabriel (dit Tony) Fegeat, Route de la Serra, Calvi, France (20)

Filed Dec. 9, 1974, Ser. No. 530,969
Claims priority, application France, Dec. 10, 1973, 73.43887
Int. Cl.² D04B 9/14
U.S. Cl. 66—9 B 6 Claims

1. Selective sliver feeding apparatus for use with a circular high pile fabric knitting machine of the type having a carding unit adapted to feed fibers derived from slivers to the needles of the machine, said apparatus comprising first rotary members to feed a first sliver to said carding unit, second rotary members to feed a second sliver to said carding unit, a rotary drive shaft, a first drive means including a first clutch operatively related to said shaft and to said first feeding members to rotate the latter to feed said first sliver to said carding unit when said first clutch is activated, a second drive means including a second clutch operatively related to said shaft and to said second feeding members to rotate the latter to feed said second sliver to said carding unit when said second clutch is activated, an over-running clutch operatively related to and interposed between said shaft and said first and said second drive means whereby the latter are driven by said shaft acting through said over-running clutch to rotate said first and said



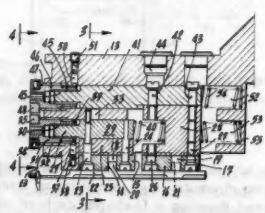
second feeding members at a predetermined speed when their respective first and second clutches are activated thereby to feed said first and said second slivers to said carding unit at a predetermined rate of feed, and additional drive means including an additional clutch operatively related to and interposed between said shaft and said over-running clutch whereby a predetermined one of said first and second drive means is driven by said shaft acting through said additional drive means and through said over-running clutch to rotate its corresponding feeding members at a speed greater than said predepermined speed thereof when its corresponding clutch and said additional clutch are activated thereby to feed the corresponding one of said slivers to said carding unit at a rate of feed greater than said predetermined rate of feed thereof.

3,959,994

CIRCULAR KNITTING MACHINE CAM ARRANGEMENT

Leopoldo Bertagnoli, Torino, Italy, assignor to Nuova San Giorgio S.p.A., Milan, Italy

Filed Nov. 18, 1974, Ser. No. 524,477
Claims priority, application Italy, Jan. 7, 1974, 19144/74
Int. Cl.² D04B 15/32
U.S. Cl. 66—54 10 Claims



1. In a circular knitting machine of the type having a needle cylinder rotatable relative to a fixed base and wherein each

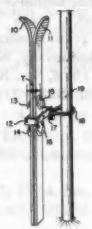
needle includes one or more heels supported for sliding movement between respective pairs of guide cams which define respective guide tracks, means for adjusting the positions of a pair of the guide cams to thereby control the length of the stroke of the needles comprising a support member fixedly supported with respect to the fixed base and having a portion thereof defining a guide, a manually adjustable element having a first threaded portion, said support member having a threaded portion engaging said first threaded portion of said manually adjustable element, a slider means supported for sliding movement within said guide, means for fixedly securing said pair of guide cams to said slider means, said manually adjustable element having a second threaded portion, the direction of the threads of said second portion being opposite to the direction of the threads of said first threaded portion, said slider means having a threaded portion engaging said second threaded portion of said manually adjustable element, whereby rotation of said manually adjustable element provides a displacement of the cam carrying slider means which is equal to the sum of the displacement of the manually adjustable elememt relative to the fixed support member and of the slider means relative to the manually adjustable element.

3,959,995

SKI LOCK

Gerald William Fletcher, 568 Valley View Way, Ventura, Calif. 93003

Filed June 9, 1975, Ser. No. 585,184
Int. Cl.² E05B *73/00*
U.S. Cl. 70—18 **2 Claims**



1. A ski lock comprising, in combination:

a. a series of five elongated rigid plates hinged together so that they can be formed into a perimeter defining a rectangle for placing about the central portions of a pair of skis positioned in bottom-to-bottom relationship, the longest of said plates having a ninety degree (90°) turned end portion for a distance equal to four times the thickness of the plates the main portion thereof defining one long side of said rectangle the other long side of said rectangle being defined by two of the five plates and the short sides being defined by the remaining two plates, the short sides of the rectangle extending across the opposite side edges of the skis respectively and the long sides of the rectangle extending transversely across the top width of the skis between the toe and heel portions of the ski bindings on each ski, respectively, the short sides having dimensions less than the combined thickness of the skis and bindings so that once in place, the rectangle cannot be slid off from the ends of the skis, the two plates making up said other long side together with the short side plate connecting to the end of said longest one of said plates opposite to its turned end being foldable in accordion style against said longest one of said plates, and the remaining plate hinged to the turned end portion of said longest one of said plates being foldable inwardly to provide a compact configuration which may be carried by a skier in his pocket; and

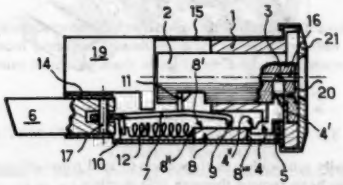
b. lock means for securing together the ends of the first and last plates in the series of plates when formed into the rectangle and for securing the rectangle to a permanent fixture so that said skis cannot be stolen.

3,959,996

ANTI-THEFT DEVICE FOR AUTOMOBILE VEHICLES

André Thirion, Dijon, France, assignor to Antivols Simplex S.A., Dijon-Saint-Apollinaire, France

Filed May 23, 1975, Ser. No. 580,410
Claims priority, application France, June 4, 1974, 74.19164
Int. Cl.² B60R *25/02*
U.S. Cl. 70—186 **3 Claims**



1. An anti-theft device for automobile vehicles of the type comprising a lock having a barrel actuated by a key, a locking bolt member extending longitudinally of the barrel, said barrel carrying a cam profile cooperating with the bolt member so as to shift the bolt member in a direction parallel to the axis of the barrel, wherein the bolt member is extended by a stem which is floatably mounted so as to be pivotable transversely of the axis of the bolt member, said stem being provided with a tab cooperating with a cam profile integral with said barrel which cam controls its transverse displacement, said stem having at the end thereof opposed to the bolt member a transverse nose portion adapted to be cooperable with a radial recess in the body of the anti-theft device, elastically yieldable means biasing said nose portion toward said recess, a radially movable push-member disposed in the bottom of said recess and elastically biased outwardly of the recess, and a key sensor radially mounted in the barrel and cooperating with said push-member.

3,959,997

PICK-PROOF LOCK SYSTEM AND METHOD FOR LOCKING A DOOR, WINDOW, OR OTHER CLOSURE

James E. Williams, Stamford, Conn., assignor to James E. Williams, Stamford and William A. Williams, Danbury, both of, Conn.

Continuation-in-part of Ser. No. 449,330, March 8, 1974, abandoned. This application Apr. 21, 1975, Ser. No. 569,869
Int. Cl.² E05B *63/00*
U.S. Cl. 70—419 **23 Claims**

1. A pick-proof method of locking and unlocking a closure including a movable barrier mounted to close and protect an inside region from an outside region, said method comprising the steps of:

providing a locking mechanism for locking said barrier closed,

providing key responsive coded lock means for controlling said locking mechanism,

positioning said coded lock means remote from said outside region in a position which is inaccessible from said outside region when said barrier is closed,

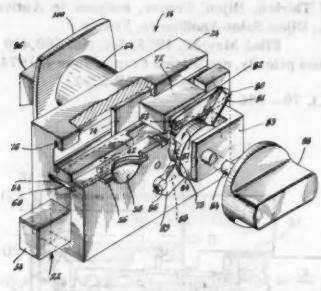
providing a route for a transportable key beginning at said outside region and extending into said coded lock means,

blocking said route to prevent access to said coded lock means from said outside region,

providing a transportable key adapted to travel said route and placing said key into the beginning of said route at said outside region,

progressively unblocking portions of said route,

moving said key along each progressively unblocked portion of said route into operative relationship with said coded lock means for unlocking said lock mechanism,



sequentially reblocking each portion of said route after said key has been moved through that portion,

thereby to deny access to said coded lock means from said outside region to prevent said coded lock means from being picked, while enabling said lock mechanism to be unlocked by moving a key along said route into engagement with said coded lock means.

3,959,998

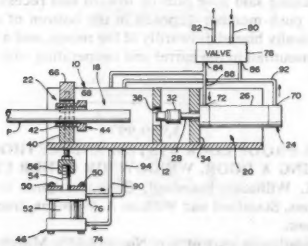
PIPE SWAGING APPARATUS

Bernard D. Ross, 2710 Emmick Drive, Toledo, Ohio 43606

Continuation-in-part of Ser. No. 284,734, Aug. 30, 1972, Pat. No. 3,838,591. This application Aug. 16, 1974, Ser. No. 498,033

Int. Cl.² B21D *41/02*

U.S. Cl. 72—312 1 Claim



1. Pipe swaging apparatus comprising

swager support means having a pipe clamping area;

swaging fluid motor means supported on said swager support means and having a piston rod for moving a swage die toward said pipe clamping area;

pipe clamping means supported on said swager support means at said pipe clamping area including a stationary bottom clamping plate and a movable top clamping plate;

a U-shaped member secured to said swager support means at said pipe clamping area beneath said bottom clamping plate;

clamp operating fluid motor means mounted on said U-shaped member and having a piston rod extending from said fluid motor through said U-shaped member, a block positioned and movable within said U-shaped member and carried by said piston rod and a pair of parallel rods mounted on said block and extending through said bottom clamping plate to couple said piston rod with said top clamping plate for moving said top clamping plate relative to said bottom clamping plate whereby a pipe to be swaged can be held stationary during swaging by said clamp operating fluid motor means,

said swaging fluid motor means including a cylinder having an advance port and a retract port and said clamp operating fluid motor means including a cylinder having an advance port and a retract port; and

valve means having a first state for supplying fluid to said retract port of said swaging cylinder and said advance port of said clamp operating cylinder to retract said swaging piston rod and advance said clamp operating piston rod to move said top clamping plate away from said bottom clamping plate and a second state for supplying fluid to said advance port of said swaging cylinder and said retract port of said clamp operating cylinder to advance said swaging piston rod and retract said clamp operating piston rod to move said top clamping plate toward said bottom clamping plate whereby swaging and clamping of a pipe are provided simultaneously.

3,959,999

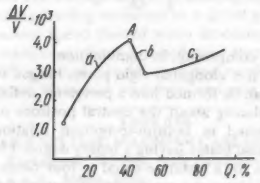
METHOD OF PRODUCING LONG-LENGTH ARTICLES FROM HOT-ROLLED CARBON STEEL AND ARTICLE PRODUCED THEREBY

Nikolai Grigorievich Filatov, Orel; Vitaly Nikiforovich Gridnev; Valentin Gennadievich Gavriljuk, both of Kiev; Jury Yakovlevich Meshkov, Kiev; Felix Isaakovich Mashlenko; Konstantin Vasilievich Mikhailov, both of Moscow; Valery Ionovich Fedorov; Vladimir Zakharovich Marchenko, both of Volgograd; Ivan Konstantinovich Lyskov, and Viktor Alexandrovich Budilovsky, both of Volgograd, all of U.S.S.R., assignors to Ivan Konstantinovich Lyskov and Viktor Alexandrovich Budilovsky, both of, U.S.S.R.

Filed Nov. 1, 1974, Ser. No. 520,215

Int. Cl.² B21C *9/00*; B21D *31/00*; C21D *7/02*

U.S. Cl. 72—364 3 Claims



1. A method of producing long-length articles from hot-rolled carbon steel, consisting essentially of the steps of:

a. descaling a wire rod of hot-rolled carbon steel;

b. applying a sublubricant coating to said descaled rod;

c. cold plastic deforming said rod within a range from a minimum effective amount to not more than 40–50% deformation whereby said deformation produces microstresses in said rod but is insufficient to cause microcracks in the surface of said rod;

d. warm plastic deforming said rod from (c) with concurrent heating of said rod to a temperature within the range 300°–600°C; and

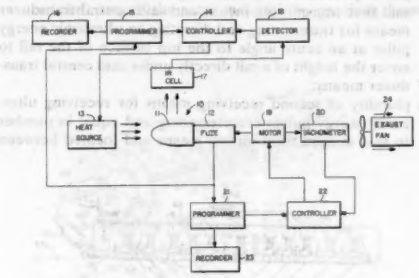
e. repeating steps (c) and (d) at least once.

3,960,000

FLIGHT SIMULATOR FOR MISSILES

Charles W. H. Barnett, Falls Church, Va.; George K. Lucey, Jr., Greenbelt, Md., and Douglas R. Augustine, Virginia Beach, Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 8, 1974, Ser. No. 522,166
Int. Cl.² G01N 25/00
U.S. Cl. 73—15.4 3 Claims



1. A flight simulator for missiles having a nose cone and a fuse body comprising: means for directing heat towards the nose cone of said missile; means for monitoring the temperature of said nose cone and providing a feedback signal to adjust the application of said heat to the desired level; means for imparting axial rotation to said missile simultaneously with the application of said heat; means for monitoring the spin rate of said fuse and providing a feedback signal to adjust the application of said rotation to the desired level; means for programming the cycle of simultaneous heat and rotation to conform to in-flight conditions; and means for monitoring the fuse function at any given time during the simulated flight.

3,960,001

BAG FILTER LEAK DETECTION

Jimmie R. Hayes, Franklin, La., assignor to Cabot Corporation, Boston, Mass.

Filed June 3, 1974, Ser. No. 475,749
Int. Cl.² G01M 3/20
U.S. Cl. 73—40.7 6 Claims

1. In a method for detection of leaks in bag filter dust collector apparatus comprising visual inspection of the exhaust side of the bag filter dust collector, the improvement which comprises introducing a tracer composition into the collection side and flowing said composition through said bag filter dust collector during the course of said inspection and locating leak sites, said tracer composition comprising a gaseous dispersion of a finely-divided particulate solid tracer medium having an average ultimate particle diameter of less than about 100 millimicrons, an apparent density of less than about 10 lbs/ft³ and a color which contrasts substantially with the color of the dust normally collected in said bag filter apparatus.

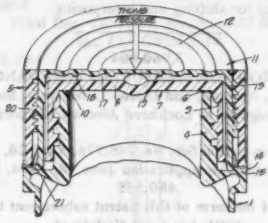
3,960,002

MEDICAL LIQUID CONTAINER WITH TACTILE STERILITY INDICATOR AND METHOD OF TESTING CONTAINER

Pradip V. Choksi, North Hollywood, and Roy B. Steidley, Seal Beach, both of Calif., assignors to American Hospital Supply Corporation, Evanston, Ill.

Division of Ser. No. 338,661, March 7, 1973, Pat. No. 3,923,179. This application Sept. 16, 1975, Ser. No. 613,636
Int. Cl.² G01M 3/32
U.S. Cl. 73—52 6 Claims

1. A method of testing the sterile integrity of a medical liquid container having inner and outer closures with a sealed sterile air space therebetween comprising the steps of: manually pushing a section of the outer closure inwardly until it contacts the inner closure to compress the sterile air which is



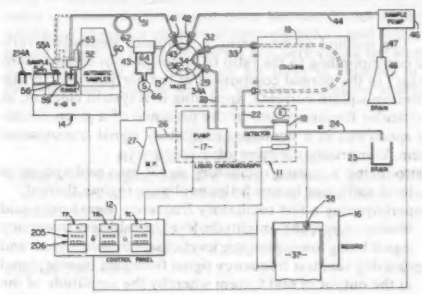
encased between the two closures; and thereafter releasing the manual pressure from the outer closure to allow the outer closure to spring back away from the inner closure.

3,960,003

AUTOMATIC SYSTEM FOR HIGH PRESSURE LIQUID CHROMATOGRAPHY

William F. Beyer, Portage Township, Kalamazoo County, and David D. Gleason, Oshtemo Township, Kalamazoo County, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Nov. 11, 1974, Ser. No. 522,455
Int. Cl.² G01N 31/08
U.S. Cl. 73—61.1 C 13 Claims



1. An apparatus for carrying out automatic high pressure liquid chromatography on a plurality of test samples, one after the other, comprising:

a source of test samples and a source of rinse liquid and means for selectively connecting said sources to a first flow path;

means associated with said first flow path for moving said test samples and rinse liquid alternatively therealong;

a high pressure liquid chromatograph and means associated therewith for producing chromatograph test results;

a source of liquid mobile phase and a second flow path isolated from said first path and extending from said liquid mobile phase source to the chromatograph;

a movable valve core containing a double ended fixed volume passage and means which in a load position of said valve core connect said core passage in series within said first path for filling by sample liquid moving along said first path;

means for (1) shifting the filled fixed volume core passage entirely out of communication with said first path while closing both valve-connected ends of said first path and for (2) instead interposing said filled core passage serially in said second path such that mobile phase flow advances

to said chromatograph only the fixed quantity of sample liquid stored in said core;

timing control means for synchronizing and actuating said selectively connecting means, said means for moving and said means for shifting and interposing.

3,960,004

METHOD FOR MEASURING IMPEDANCE

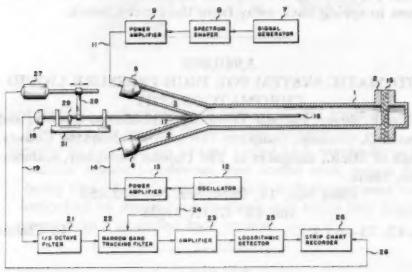
Leslie S. Wirt, Newhall, and Duane L. Morrow, Saugus, both of Calif., assignors to Lockheed Aircraft Corporation, Burbank, Calif.

Continuation-in-part of Ser. No. 245,776, April 20, 1972, Pat. No. 3,824,842. This application June 18, 1974, Ser. No. 480,555

The portion of the term of this patent subsequent to July 23, 1991, has been disclaimed.

Int. Cl.[2] G01N *29/00*

U.S. Cl. 73—67.1 3 Claims



1. The method of measuring a frequency dependent variable corresponding to the ratio of force (or root-mean-square voltage) to the normal component of the particle velocity (or root-mean-square current), appearing in a system element, at a particular frequency and in the presence of a given excitation spectrum, in a nonlinear oscillatory signal transmission system, comprising the steps of:

introducing a biasing oscillatory signal into said system at level sufficient to reach the nonlinear regime thereof;

superimposing a test oscillatory frequency signal onto said biasing signal, the amplitude level of said test frequency signal being lower than the level of said biasing signal; and

separating said test frequency signal from said biasing signal at the output of said system whereby the amplitude of the extracted test frequency signal corresponds to the frequency-dependent variable of said system.

3,960,005

ULTRASONIC TESTING DEVICE FOR INSPECTING THERMIT RAIL WELDS

Georges E. Vezina, Laval-des-Rapides, Canada, assignor to Canac Consultants Limited, Montreal, Canada

Filed Aug. 9, 1974, Ser. No. 496,310

Int. Cl.[2] G01N *29/04*

U.S. Cl. 73—67.7 12 Claims

1. Ultrasonic testing device for inspecting thermit rail welds in a track comprising

a longitudinal shoe adapted to be placed lengthwise along the top surface of a rail;

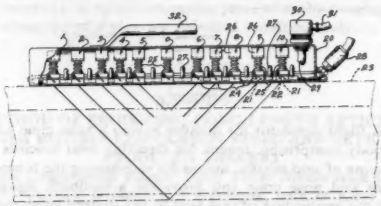
a first means for transmitting an ultrasonic energy pulse in a downwards path towards a location on the under surface of the rail;

a first means for receiving an ultrasonic energy pulse and for receiving an echo of the transmitted pulse reflecting from the location on the under surface of the rail, said first transmitting means and said first receiving means being spaced a predetermined distance apart along said shoe and said location on the under surface of the rail being below the midpoint between said first transmitting means and said receiving means said first transmitting and receiving means for detecting porosity and a lack of fusion in the rail weld;

a central transducer means positioned midway between said first transmitting means and said first receiving means for transmitting and receiving an ultrasonic energy pulse in and from a vertically downward direction, respectively for detecting the location of a rail weld;

a plurality of second transmitting means located between said first transmitting means and said central transducer means for transmitting and directing an ultrasonic energy pulse at an acute angle to the top surface of the rail to cover the height of a rail directly under said central transducer means;

a plurality of second receiving means for receiving ultrasonic energy pulses corresponding and equal in number to said second transmitting means and located between



said central transducer means and said first receiving means, each second receiving means having a combination of spacing from the other said second receiving means, of spacing from said corresponding transmitting means, and of receiving an ultrasonic energy pulse at predetermined angles such that the pulses that are received are those pulses transmitted by said corresponding transmitting means which have been reflected by an area of porosity located substantially under said central transducer means, said corresponding pairs of second transmitting and receiving means for detecting porosity of the weld and the height in the rail of any determined areas of porosity;

and means for indicating the transmission of each pulse, the receiving of the echos of the respective pulses, and the time interval for the pulses to pass downward through the rail and the echos of the respective pulses to pass upward through the rail.

3,960,006

NON-DESTRUCTIVE TEST APPARATUS AND METHOD FOR A MATERIAL HAVING A CAVITY THEREIN

Robert D. Smith, Elk Grove Village, Ill., assignor to Aico Standard Corporation, Valley Forge, Pa.

Filed Dec. 3, 1973, Ser. No. 421,131

Int. Cl.[2] G01N *29/04*

U.S. Cl. 73—67.8 S 13 Claims

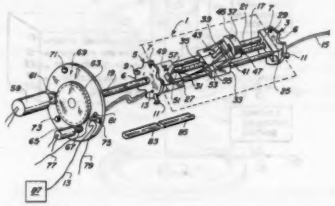
1. A non-destructive test apparatus for detecting and providing three-dimensional analysis of flaws in a horizontally positioned generally cylindrical rotor having a relatively large mass of material, a central bore with a diameter small in comparison to the diameter of the rotor and providing a test cavity being located in the rotor, comprising:

signal transmitting means to be inserted into the bore of the rotor, said signal transmitting means including at least two signal sources capable of simultaneously transmitting at least two ultrasonic signals from the bore into the mass of the rotor, said ultrasonic signals being selectively chosen from among the various ultrasonic modes;

pickup means to detect said ultrasonic signals as they are reflected from discontinuities throughout the mass of the rotor material, each of said reflected ultrasonic signals

being identified with the corresponding transmitted ultrasonic signal and providing information regarding the discontinuities from which they are reflected;

position determining means providing for the direct correlation of the information content of a transmitted or reflected ultrasonic signal in one mode with the information content of reflected ultrasonic signals and unreflected transmitted ultrasonic signals in another mode, the information content of said transmitted and said reflected signals relating to discontinuity characteristics throughout the mass of the rotor material, by precisely locating



in a three-dimensional matrix the path through the rotor mass of each transmitted ultrasonic signal and the position of discontinuities in the rotor material evidenced by each reflected ultrasonic signal; and

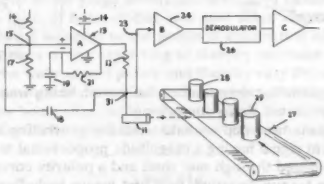
recording means for preserving the information content of said transmitted and said reflected ultrasonic signals in a fashion that permits combining the individual information content of each of said transmitted and said reflected ultrasonic signals in the different modes to derive an accurate indication of the existence, position, nature size and shape of flaws in the rotor material.

3,960,007

ULTRASONIC STANDING WAVE SENSOR

Eugene T. Swensen, 2400 W. 102nd St., Apt. 313, Minneapolis, Minn. 55431

Filed Sept. 27, 1974, Ser. No. 510,078
Int. Cl.² G06M 7/04
U.S. Cl. 73—67.8 R **3 Claims**



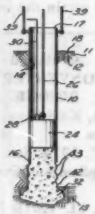
1. An ultrasonic standing-wave sensor which comprises
a. an amplifier-oscillator,
b. a power source connected to said ammplifier-oscillator,
c. first and second resistive impedance devices connected in series between said power source and ground,
d. said first and second devices connected to said amplifier-oscillator to bias said amplifier-oscillator at the electrical midpoint between the said power source and ground,
e. an electrically driven ultrasonic transducer, and
f. capacitive impedance means interconnecting said first and second devices at said electrical midpoint and said transducer to establish a phase lag of greater than 90° between said transducer and the amplifier-oscillator input.

3,960,008

PILE CAPACITY TESTING MEANS

George G. Goble, 18908 Lomond Blvd., Shaker Heights, Ohio 44094, and Frank Rausche, 38320 North Lane, Willoughby, Ohio 44094

Filed Dec. 12, 1974, Ser. No. 532,050
Int. Cl.² G01N 3/34
U.S. Cl. 73—84 **5 Claims**



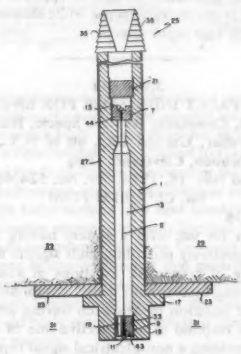
1. A method of determining the static load capacity of a concrete pile during its construction comprising the steps of providing deceleration measuring means on a hammer of predetermined mass, charging a hole with a known mass of concrete, dropping the hammer on the charge of concrete to drive the concrete into a base of the hole, measuring the deceleration of the hammer with the decelerometer, integrating the deceleration to determine the velocity of the hammer, calculating the resistance of the soil by computing the product of the combined mass of the hammer and the charge of concrete and the value of the deceleration of the hammer substantially at the point of zero velocity, when a desirable resistance value is obtained after one or more hammer blows adding an additional charge or charges of concrete before said first-mentioned charge of concrete has set and performing the steps of determining the soil resistance set forth in relation to the first-mentioned charge with at least one successive charge.

3,960,009

ROCKBOLT SAFETY GAGE

Wallace W. Roepke, 640 3rd Ave., Excelsior, Minn. 55331, and Patrick J. Cain, 15900 N. Lund Road, Eden Praire, Minn. 55343

Filed May 2, 1975, Ser. No. 574,165
Int. Cl.² G01B 17/04
U.S. Cl. 73—88 F **8 Claims**



1. A vibrating wire gage for use with a mine rockbolt comprising:

an elongated cylindrical body having an internal cavity with an upper and lower end;

a taut vibratory wire anchored near its two ends and adapted to fit within said cavity and extend between the two cavity ends; means at the upper end of said body for attaching a rockbolt shaft thereto;

cavity access means located near the cavity's lower end for allowing the insertion of a plucking device into the cavity to provide for the mechanical plucking of said wire; and

adjustable anchoring means at the lower end of the cavity acting to adjustably retain the wire's lower end.

3,960,010

ANALOG-DIGITAL CONVERTER FOR A RESISTANCE BRIDGE

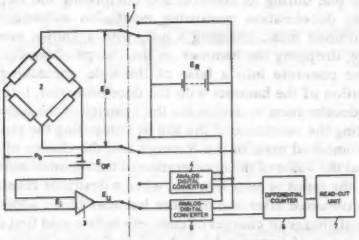
Jan Kenneth Gustafsson, Karlskoga, Sweden, assignor to AB Bofors, Bofors, Sweden

Filed Oct. 21, 1974, Ser. No. 516,845

Claims priority, application Sweden, Oct. 23, 1973, 7314340

Int. Cl.² G01B 7/16

U.S. Cl. 73—88.5 R **4 Claims**



1. Apparatus for providing a digital signal representative of the unbalance of a resistance bridge comprising:

a resistance bridge having input means and output means,

means for applying first and second direct-current voltages of opposite polarity but equal amplitude alternately and repetitively to said input means,

amplifier means connected to said output means,

analog-to-digital converter means responsive to said amplifier means,

counting means controlled by said converter means,

and means controlling said counting means to count in one sense while said first voltage is applied to said input means and in the opposite sense while said second voltage is applied to said input means.

3,960,011

FIRST FAULT INDICATOR FOR ENGINES

Alfred C. Renz, Commack; Roy W. Spacie, Huntington, and Edward J. Fuller, Garden City, all of N.Y., assignors to Harris Corporation, Cleveland, Ohio

Filed Nov. 18, 1974, Ser. No. 524,489

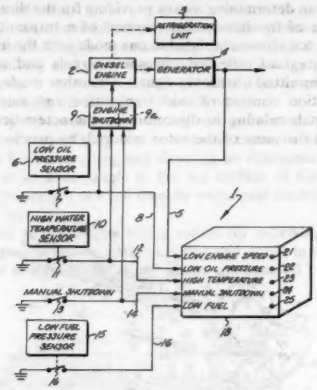
Int. Cl.² G01M 15/00

U.S. Cl. 73—116 **23 Claims**

1. A monitor for use with a system having a plurality of sensors for respectively providing fault signals in response to faults occurring at respective locations in said system and capable of causing system shut down, comprising:

a plurality of isolation means each having an input circuit adapted to respond to a respective one of said fault signals for providing a non-electrical signal representative of said fault signal, and an output circuit electrically isolated from said input circuit and having means responsive to said non-electrical signal to provide a second electrical fault signal; and,

indicating means connected to said output circuits of said plurality of isolation means and responsive to said second



fault signals for indicating the first occurring fault in the monitored system.

3,960,012

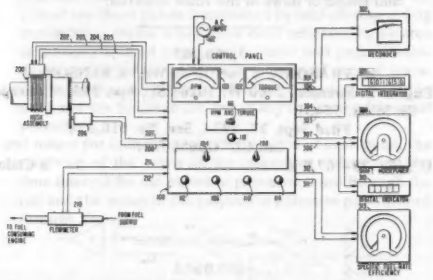
SHAFT HORSEPOWER AND EFFICIENCY MONITORING SYSTEM

Maxwell Ingram, 15 Hamilton Ave., Dumont, N.J. 07628

Filed May 14, 1974, Ser. No. 469,900

Int. Cl.² G01L 3/24

U.S. Cl. 73—136 A **33 Claims**



1. A system for determining the power being transmitted through a rotated shaft, comprising:

first means mounted on said shaft for generating a direct current signal having a magnitude proportional to torque transmitted through said shaft and a polarity corresponding to torque direction, said first means including a husk assembly clamped about said shaft;

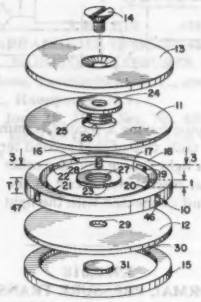
second means coupled with said husk assembly for generating a direct current signal having a magnitude proportional to shaft rotational speed and a polarity corresponding to rotation direction; and

electronic circuit means having first and second inputs connected to receive said generated direct current signals from said first and second means, respectively and an output; said circuit means electronically multiplying said signals to produce a direct current signal at said output proportional in magnitude and polarity to the product of said first and second input signals whereby said direct current output signal is linearly representative of the horsepower being transmitted through said shaft in either forward or reverse directions.

3,960,013
PLATFORM LOAD CELL

Alfred Newman Ormond, 11969 E. Rivera Road, Santa Fe Springs, Calif. 90670

Filed Mar. 4, 1975, Ser. No. 555,141
Int. Cl.² G01L 1/22
U.S. Cl. 73—141 A 5 Claims



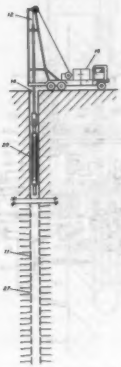
1. A platform load cell comprising, in combination:
a. a flat disc having an inner portion and outer ring integrally connected together by flexure webs at spaced circumferential points;
b. upper and lower flat diaphragms sandwiching said disc therebetween secured only to the top and bottom surfaces of the outer ring and top and bottom central areas of the inner portion;
c. a platform above the upper diaphragm and secured to a central portion thereof;
d. a circular base supporting the under peripheral portion of the lower diaphragm;
e. strain gauge means on said flexure webs, said diaphragms constraining movement of said inner portion relative to said outer ring to a vertical axial direction so that output signals from said strain gauges constitute a function only of the vertical load component of a load placed on said platform, side forces and moments resulting from off-center loading on said platform being isolated by said diaphragms; and,
f. means in said flat disc for equalizing the sensitivity of the several strain gauge means and associated flexure webs in the form of holes drilled into said outer ring to remove material adjacent to the points of connection of the flexure webs to the outer ring to thereby decrease the fixity of the webs at said points and thereby vary the sensitivity of the webs and associated strain gauges, the depth of said holes being adjusted to values at which the sensitivities of all the webs and associated strain gauges are equal.

3,960,014
METHOD OF OBTAINING PERMEABILITY INFORMATION FROM AN UNDERGROUND FORMATION PENETRATED BY A WELL

Stanley O. Hutchison, Bakersfield, and Glenn W. Anderson, Oildale, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Dec. 20, 1974, Ser. No. 534,954
Int. Cl.² E21B 49/00
U.S. Cl. 73—151 7 Claims

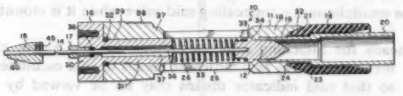
1. A method of obtaining permeability information from an underground formation penetrated by a well having a tubular member with at least one flow opening therein and positioned under liquid in said well adjacent said formation comprising the steps of inserting into a well adjacent an opening in a tubular member positioned under liquid adjacent an underground formation an extrudable rubber like impression forming material, said impression forming material being capable of being at least partially extruded into said opening and retracted therefrom, contacting said tubular member adjacent said opening with said material for a period of time and at a pressure normally sufficient to extrude at least a portion of said material into said opening if said opening is connected to permeability, removing said material from contact with said tubular member, removing said material from said well and examining said material for extrusions to determine if said opening in said tubular member is effectively connected to permeability.



3,960,015
WELL FLOW SENSING APPARATUS

Marion Barney Jett, Dallas; Jay Warner Jackson, Arlington, and Richard Eugene Irby, Irving, all of Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Continuation-in-part of Ser. No. 558,871, March 17, 1975.
This application June 4, 1975, Ser. No. 583,733
Int. Cl.² E21B 47/10
U.S. Cl. 73—155 18 Claims

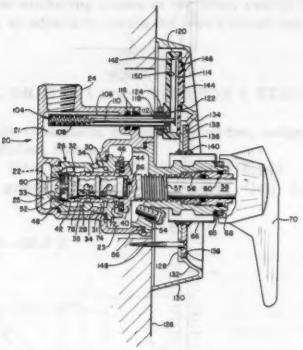


1. Flow sensing apparatus for generating a signal in response to a flow condition through a flow conduit comprising;
elongated tubular body means sized for close-fitting insertion into a flow conduit and adapted to force a substantial portion of the fluid flow in the conduit therethrough, and having elastomeric seal means thereon arranged to seal against the inner surface of a flow conduit;
a flow responsive member slidably located in said tubular body means and adapted to close the inner passage of said body means in one position of said member;
biasing means in said body means abutting said member and continuously urging said member against the fluid flow through said body means towards said closing position in said body means;
extension means attached to said member and extending slidably out of said body means; and,
switch means operably engaging said extension means and arranged to convert movements of said extension means into pulse signals.

3,960,016
WATER MIXING VALVE WITH TEMPERATURE INDICATOR

Paul C. Symmons, Duxbury, Mass., assignor to Symmons Industries, Inc., Braintree, Mass.

Filed Feb. 14, 1974, Ser. No. 442,327
Int. Cl.² G01K 1/14; G05D 23/13
U.S. Cl. 73—343 R **6 Claims**



1. A plumbing fixture comprising:

a mixing valve for mixing hot and cold water adapted for mounting in a wall, said valve including a valve body with hot and cold water inlets, a control member extending into said valve body for selecting the relative amounts of hot and cold water passing through said valve, and an outlet chamber in said valve body for discharging water mixed in said valve;

a water temperature sensor disposed in said outlet chamber in position to sense the temperature of water in said chamber;

temperature indicator means coupled to said sensor for indicating the water temperature in said outlet chamber, said temperature indicator means being disposed outside of said valve body and comprising a temperature scale and a movable pointer which is mechanically connected to said sensor so that said pointer will move relative to said scale in accordance with changes in the temperature of the water in said outlet chamber sensed by said sensor;

an escutcheon for concealing said valve when it is mounted in a wall;

means for attaching said escutcheon to said valve; and

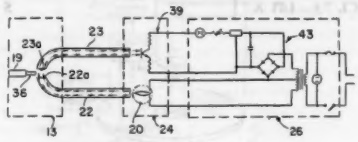
means mounting said indicator means to said escutcheon so that said indicator means may be be viewed by an observer.

3,960,017
THERMOMETER INSERTABLE IN WINDING OF FLUID COOLED TRANSFORMER

Robert F. Romanowski, Rochester, N.Y., assignor to Qualitrol Corporation, Fairport, N.Y.

Filed Feb. 10, 1975, Ser. No. 548,350
Int. Cl.² G01K 1/14, 5/52, 13/02
U.S. Cl. 73—349 **5 Claims**

1. The combination comprising an electrical transformer apparatus having a tank containing cooling fluid in which the coils of a transformer winding are immersed, a thermometer having a body of ceramic dielectric material inserted in a space between the coils, a dielectric heat sensing rod of plastics material disposed within a channel internally of the body having one end fixed to the latter and the other end free, a pair of light pipes of fiber optic dielectric material each having one terminal end face disposed in the body in opposed spaced relation to that of the other proximate the free end of the sensing rod, the sensing rod being responsive to heat of a predetermined value developing within the cooling fluid to expand linearly relative to the channel to project its free end between the said terminal end faces of the light pipes, a light signal electrical converter device located externally of the

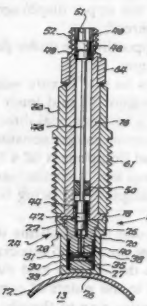


tank, each light pipe having a second terminal end extending externally of the tank, one of said second terminal ends being connected with a light source and the other being connected with a light signal responsive circuit in the converter, and a signal read-out unit connected with the light signal responsive circuit.

3,960,018
CONFORMAL PRESSURE TRANSDUCER

Nicholas D. Change, West Seneca, and Michael T. Riggs, Batavia, both of N.Y., assignors to PCB Piezotronics, Inc., Depew, N.Y.

Division of Ser. No. 381,700, July 23, 1973, Pat. No. 3,886,792, which is a continuation-in-part of Ser. No. 234,017, March 13, 1972, abandoned. This application Nov. 7, 1974, Ser. No. 521,687
Int. Cl.² G01L 9/08
U.S. Cl. 73—398 R **9 Claims**



1. A transducer for converting pressure changes into electrical signals wherein the pressure changes act on one surface of a relatively thin wall, said transducer comprising:

a. a housing;

b. force transmitting means on one end of said housing and having a contoured end surface conforming to the other surface of said wall opposite the surface on which said pressure changes act;

c. piezoelectric means within said housing and mechanically connected to said force transmitting means;

d. electrical path defining means for connecting said piezoelectric means to means for deriving an electrical signal; and

e. alignment guide means carried by said housing and extending from said housing and having a fixed alignment relative to said contoured end surface of said force transmitting means for engaging a body containing said wall at a location having a predetermined alignmemt with respect to said other surface of said wall to align said contoured end surface of said force transmitting means with said other surface of said wall;

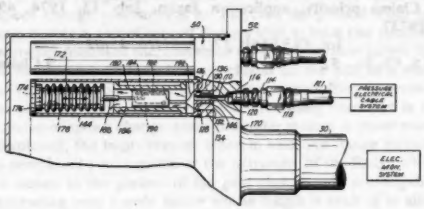
f. whereby when said contoured end surface of said force transmitting means firmly contacts and conforms to the other surface of said wall, pressure applied through said wall to said contoured end surface deforms said piezoelectric means to generate an electrical output signal proportional to the applied pressure.

3,960,019

CANNISTER ARRANGEMENT OF TRANSDUCERS TO MONITOR PRESSURES

William J. Jakobsen, Farmingdale, N.Y., assignor to Lourdes Industries, Inc., Hauppauge, N.Y.

Filed June 28, 1974, Ser. No. 484,097
Int. Cl.[2] G01L *9/02, 7/06*
U.S. Cl. 73—420 **30 Claims**



1. Transducer apparatus comprising a casing having an access opening, engaging means for holding said casing and closure together in sealed relation, said closure being provided with a bore extending therethrough, conduit means supplying to said bore a pressure medium to be monitored, electrical means including electrical contacts adjacent said bore within said casing, and transducer means supported on said closure within said casing,, said transducer means being coupled to said bore and contacts and responding to said pressure medium to produce a signal at said contacts, said closure being provided with a plurality of further bores in addition to the first said bore, said conduit means supplying pressure medium separately to each of said bores, said electrical means including further electrical contacts adjacent each of said further bores, said transducer means including transducer units in each of said bores.

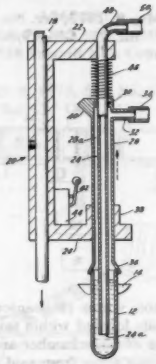
3,960,020

LIQUID ASPIRATING PROBE ASSEMBLY OF A SUPPLY ANALYZER

Abraham Gordon, Teaneck, N.J., and Stanford L. Adler, Monsey, N.Y., assignors to Technicon Instruments Corporation, Tarrytown, N.Y.

Filed Dec. 30, 1974, Ser. No. 537,615
Int. Cl.[2] G01N *1/14*
U.S. Cl. 73—423 A **14 Claims**

1. A sample analyzer comprising an aspirating probe element having an inlet for immersion successively in liquids contained in a series of receptacles and for relative retraction to an upper position prior to immersion in the liquid of another receptacle, and means flushing a wash solution down the exterior of said probe element in said upper position and



drawing off substantially all the flushed solution through said probe inlet.

3,960,021

SAMPLING APPARATUS

Calvin Jones, Marlboro, N.Y., assignor to Dairylea Cooperative Inc., Pearl River, N.Y.

Filed Oct. 4, 1973, Ser. No. 403,432
Int. Cl. G01n *1/12*; **B67b** *7/16*
U.S. Cl. 73—425.4 R **18 Claims**

1. An apparatus for taking liquid samples from containers thereof under substantially sanitary conditions comprising:

a. an elongated shaft;

b. means for retaining a sample vial associated with the lower part of said elongated shaft; and

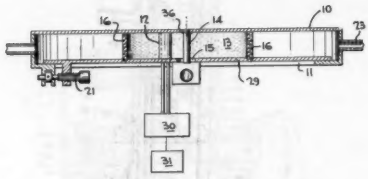
c. means for removing a vial cap from a sample vial, retaining said cap, and replacing said cap upon a sample vial, associated with the upper part of said elongated shaft.

3,960,022

NULL ADJUSTABLE VORTEX RATE SENSOR

Arthur J. Ostdiek, Wheaton, and Lyndon S. Cox, Silver Spring, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 9, 1973, Ser. No. 358,421
Int. Cl.² G01P *9/00*
U.S. Cl. 73—505 **3 Claims**



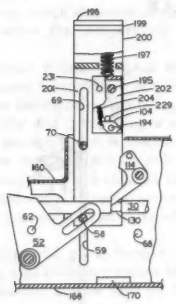
1. A null adjustable vortex rate sensor comprising a chamber, a drain centrally located within said chamber, a pickoff secured to the base of said chamber and extending into said chamber at a distance away from said drain, and means for adjusting the position of a fluid stream stagnation point on said pickoff.

3,960,023

STORED ENERGY EJECTOR MECHANISM

Edward Richard Gralinski, Andover, N.J., assignor to Donley, Miller & Nowikas, East Hanover, N.J.

Filed June 9, 1975, Ser. No. 584,953
Int. Cl.² G05G *17/00*
U.S. Cl. 74—2 **12 Claims**



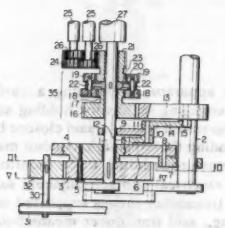
1. A stored energy ejector mechanism adapted for mounting on a punch press, a conveyor support and like apparatus wherein workpieces are to be selectively removed by the ejector mechanism at selected times in the operation thereof, said ejector mechanism including: (a) a housing; (b) an ejector plunger reciprocably carried in guideways provided in said housing; (c) biasing means associated with the ejector plunger and adapted to move the ejector rapidly in one direction; (d) means for limiting the extent of movement of the plunger in said one direction; (e) at least one actuator lever carried by the housing and movable so as to engage the plunger and move the plunger counterflow to the bias urged direction and to a "loaded" biased position; (f) an energizer fork operatively connected to the actuator lever, said energizer fork operatively moved from the topmost position and toward the base of the housing by striking means associated with the apparatus and with which the ejector mechanism is associated; (g) spring means which include at least one spring carried by the housing and arranged to provide the necessary biasing means required to move the energizer fork to a determined upward position and during this upward movement of the fork to its upwardmost position to move the actuator lever to its loaded condition; (h) means for establishing the limit of said upward position of the energizer fork; (i) trigger means in association with the ejector plunger and adapted to engage and retain said ejector plunger in a "cocked" condition as and after the actuator lever has moved the plunger to its biased loaded condition, and (j) trigger release means associated with and moved by the energizer fork to and during the beginning portion of the upward movement of this fork, said trigger release means when actuated removing the retaining engagement of the trigger and permitting the released plunger under the influence of the bias means to move rapidly to its extent of movement.

3,960,024

APPARATUS FOR DRIVING DETACHING ROLLERS IN TEXTILE COMBING MACHINES

Mitsuo Mori, Toyota, and Kengo Ohashi, Takahama, both of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Tokyo, Japan

Filed July 9, 1975, Ser. No. 594,513
Claims priority, application Japan, July 13, 1974, 49-079737
Int. Cl.² F16H *37/12, 21/16, 35/02*
U.S. Cl. 74—52 **9 Claims**



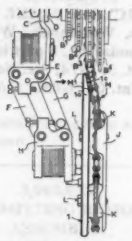
1. An apparatus for driving detaching rollers of a textile combing machine provided with a frame, a combing cylinder, a differential gear connected to said detaching rollers and a drive means connected to said differential gear for imparting a uniform rotary motion thereto, comprising a first link motion mechanism for creating a basic variable rotational motion cycle corresponding to a pilgrim step motion cycle of said detaching rollers in one complete rotation of said combing cylinder comprising a forward and rearward rotation thereof and a forward rotation thereof at a very slow speed and/or stopping rotation thereof, a second link motion mechanism for adjusting said basic motion cycle, said first link motion mechanism being driven by said drive means while said second link motion mechanism being driven by an output of said first link motion mechanism, an output of said second link motion mechanism being transmitted to said differential gear mechanism wherein said uniform rotary motion is superimposed with said output of said second link motion mechanism so that a predetermined pilgrim step motion cycle is imparted to said deteching rollers.

3,960,025

PUSH FLANGE CONSTRUCTION FOR A PIVOTAL ROLLER SYSTEM OF A SPEED CHANGE MECHANISM

Lucien Charles Hippolyte Juy, rue de la Breuchilliere, Zone Industrielle Nord, 21003 Dijon Cedex, Cote d'Or, France

Filed May 30, 1975, Ser. No. 582,424
Int. Cl.² F16H 11/00, 9/00, 11/08
U.S. Cl. 74—217 B 11 Claims



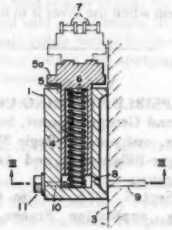
1. Push flange construction for a pivotal roller system for speed change mechanisms for bicycles, the pivotal roller system having a pair of spaced flanges with at least one rotatable sprocket mounted therebetween on which a chain passes and is wound on a pinion of a gear cluster on the hub of a wheel of the bicycle, one of the flanges being a push flange operative to push the chain onto pinions of increasing diameter in the course of speed change when the roller system is transversely displaced, the improvement wherein said one flange includes a peripheral prolongation at the extremity of the flange which is closest to the pinions of the gear cluster, said prolongation extending over a wide sector whose length is such as to allow contact with the chain and pushing thereof closest to the pinions whatever the angular position of the roller system, said prolongation having a surface facing the chain and being provided thereon along the length of said sector with a wide profiled chamfer for engaging the chain.

3,960,026

TIMING CHAIN TENSIONER

Masaru Hibino, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Jan. 9, 1975, Ser. No. 539,788
Claims priority, application Japan, Jan. 25, 1974, 49-10908
Int. Cl.² F16H 7/12
U.S. Cl. 74—242.11 S 3 Claims



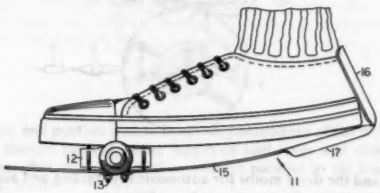
1. A timing chain tensioner for an internal combustion engine comprising a tensioner housing to be attached to an outer wall of the engine block, said housing being formed with a cylinder bore therein, a plunger slidably fitted in said cylinder bore and having at its exposed end a head adapted to engage a timing chain, a spring placed in said cylinder to bias said plunger headward, said housing also having a passage therein for communicating said cylinder bore with the atmosphere, a closure member for closing said passage, and an oil passage for introducing a pressurized lubricating oil thereinto from a lubricating system in the engine.

3,960,027

BICYCLE PEDAL ATTACHMENT

Leo D. Magnuson, 2928 Summit Hills Court, Bettendorf, Iowa 52722

Filed Oct. 8, 1975, Ser. No. 620,838
Int. Cl.² G05G 1/14
U.S. Cl. 74—594.6 4 Claims



1. A bicycle pedal attachment having a heel member for engaging the back of a bicyclist's shoe comprising:

a supporting strip of sufficient length to extend rearwardly from a bicycle pedal below the sole of a bicyclist's shoe to the back thereof, means for attaching one end of said supporting strip to a pedal of a bicycle such that said strip extends rearwardly past that portion of a crossbar of a pedal that faces downwardly while said pedal attachment is being used, spring means for urging said rearwardly extending portion of said strip obliquely upwardly with respect to the face of a pedal against which the sole of a bicyclist's shoe is to be pressed, said heel member extending upwardly from the other end of said strip for engaging that portion of a shoe back of the upper portion of a bicyclist's heel, and said strip having sufficient freedom of motion and said spring means having sufficient spring tension to urge said strip and said heel member upwardly against the heel of a bicyclist's shoe for all normal inclinations of the heel during normal revolutions of a bicycle pedal to which said strip is attached.

3,960,028

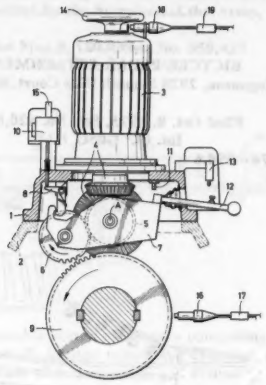
ROTOR ALIGNMENT APPARATUS FOR A PROCESSING AND POWER GENERATING MACHINE

Rolf Martin, Sonthofen, Allgau, Germany, assignor to BHS-Bayerische Berg Hutten-und Salzwerke Aktiengesellschaft, Munich, Germany

Filed Feb. 6, 1975, Ser. No. 547,665
Claims priority, application Germany, Feb. 6, 1974, 2405721.
Int. Cl.² F16H 57/00
U.S. Cl. 74—405 6 Claims

1. A rotor alignment apparatus for a processing and power generating machine comprising, a drive motor, a gear propelled by said drive motor, a pinion carried by a locking and unlocking pivoting apparatus arranged to move the pinion into and out of driving engagement with said gear, at least one revolution recorder associated with said machine, the locking and unlocking of said pivoting apparatus being controlled by the recorder through signals received from the machine, the machine including a toothed rim carried on a shaft thereof, a shutdown transmitter associated with said rim and a stroke

magnet associated with said pivoting apparatus, said shutdown transmitter being controllably connected with the stroke magnet and the drive motor for automatically starting and aligning the apparatus from a stopped condition.



3,960,029

GEAR DRIVE

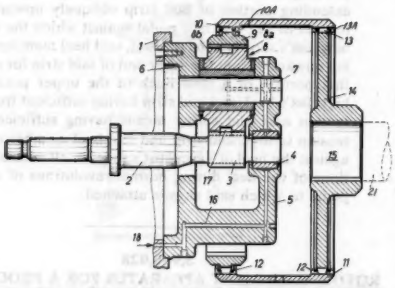
Johann Eichinger, Putzbrunn, Germany, assignor to Carl Hurth, Maschinen- und Zahnradfabrik, Munich, Germany

Filed Mar. 25, 1975, Ser. No. 561,671

Claims priority, application Germany, Apr. 2, 1974, 7411435

Int. Cl.² F16H *1/06, 57/04*; F01M *9/10*

U.S. Cl. 74—413 **4 Claims**



1. A gear drive arrangement, comprising:

a first spur gear having a plurality of straight and parallel teeth thereon and first support means supporting said first spur gear for rotation about a first axis of rotation;

a second spur gear equal in width to said first spur gear and having a plurality of straight and parallel teeth thereon and second support means supporting said second spur gear for rotation about a second axis of rotation, said teeth on said second spur gear meshing with said teeth on said first spur gear only over a small zone of said diameters of said first and second spur gears so that a majority of teeth on said first and second spur gears are free of engagement with each other;

lubricant means for lubricating said first and second spur gears; and

annular groove means around the periphery of said second spur gear and in the center of the width thereof for receiving the axial flow of lubricant between the teeth in at least said zone of meshing engagement between said first and second spur gears to thereby minimize the power loss due to the presence of said lubricant, said groove being at least as deep as the tooth height, said teeth of said first spur gear being free of a peripheral groove.

3,960,030

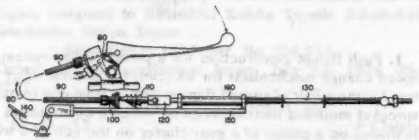
MOTORCYCLE BRAKE SYSTEM

Stephen S. Williams, Woodinville, Wash., assignor to The Raymond Lee Organization, a part interest

Filed Oct. 3, 1974, Ser. No. 511,646

Int. Cl.² G05G *11/00*

U.S. Cl. 74—481 **3 Claims**



1. Apparatus for use with a motorcycle having handle bars, a front wheel brake and a rear wheel brake for providing a braking action that is properly balanced between front and rear brakes, said apparatus comprising:

a hand operated lever secured to the handle bars, said lever having a first position at which no braking action ensues and a second position at which both front and rear brakes are actuated;

a first cable connected between said lever and the front brake, said first cable causing the front brake to be actuated when the lever is in the second position, said front brake being deactuated when the lever is in the first position;

an elongated horizontal rod connected at its end to the rear brake and extending forwardly, said rod being slidable along its axis between a rear position at which the rear brake is deactuated and a forward position at which the rear brake is actuated; and

a second cable connected between the lever and the rod, said second cable placing the rod in its rear position when the lever is in its first position and placing said rod in its forward position when the lever is in its second position.

3,960,031

COLLAPSIBLE STEERING COLUMNS

Alain Chometon, and Georges Boquet, both of Boulogne-Billancourt, France, assignors to Regie Nationale des Usines Renault, Boulogne-Billancourt, and Automobiles Peugeot, Paris, both of France

Filed Sept. 5, 1975, Ser. No. 610,823

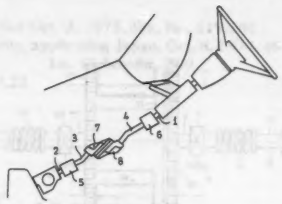
Claims priority, application France, Sept. 11, 1974, 74.30770

Int. Cl.² B62D *1/18*

U.S. Cl. 74—492 **8 Claims**

1. Collapsible device for the steering column of motor vehicles, adapted to be sunk when a sudden and strong pressure is exerted thereof, which comprises a pair of members having parallel sliding faces, wherein each one of said members comprises on its sliding face a locking contour, said locking contours being conjugate with each other and having a male and female configuration respectively, said members

being retained in their normal locked condition by an injection of plastic cement of calibrated strength, said members



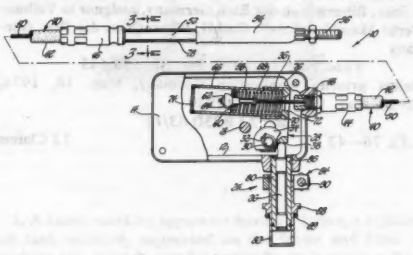
further comprising means for securing same to relevant sections of a steering column.

3,960,032

MOTION TRANSMITTING REMOTE CONTROL ASSEMBLY

Charles M. Schiff, Mentor, Ohio, assignor to Teleflex Incorporated, North Wales, Pa.

Filed Mar. 10, 1975, Ser. No. 557,078
Int. Cl.² F16C *1/10*
U.S. Cl. 74—501 R **17 Claims**



1. A motion transmitting assembly comprising: guide means having first and second ends; a flexible motion transmitting core element slidably supported in said guide means and having first and second ends extending from said ends of said guide means; control means including movable means, stop means for limiting the movement of said movable means, and spring means operatively interconnecting said movable means and said first end of said core element whereby movement of said core element is transmitted through said spring means to said movable means; and spacer means for reacting between said core element and said guide means to position said core element relative to said guide means for moving said movable means against said stop means and applying a predetermined force to said spring means.

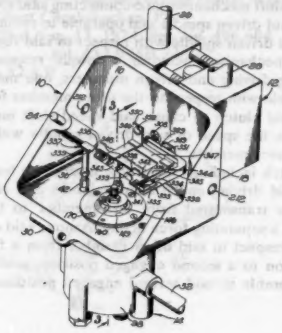
3,960,033

FLOWMETER AND FUNCTION GENERATOR THEREFOR

Victor Nicholas Lawford, Pasadena; Richard Paul Granada, West Covina, and Peter Elderton, Fountain Valley, all of Calif., assignors to International Telephone and Telegraph Corporation, New york, N.Y.

Filed Aug. 8, 1974, Ser. No. 495,667
Int. Cl.² G05G *1/04*
U.S. Cl. 74—522 **2 Claims**

1. A function generator comprising: a base; an input member movable on said base; a lever pivoted about an axis from said input member; support means mounted on said base; at least one fulcrum, said lever being movable with said input member to a position engageable with said fulcrum, said fulcrum having an end portion engageable with said lever; and adaptive means mounting said fulcrum on said support means, said adaptive means being adjustable in a manner to move said



fulcrum end portion with at least one component of the movement thereof normal to the length of said lever and with at least another component of movement parallel to the length of said lever.

3,960,034

FLYWHEEL WITH ANTI-CRACKING SAFEGUARD FOR PROTECTION AGAINST OVERSPEED

Maximilian Hintergraber, Dietzenbach, Germany, assignor to Kraftwerk Union Aktiengesellschaft, Mulheim (Ruhr), Germany

Filed July 16, 1974, Ser. No. 488,921
Claims priority, application Germany, July 27, 1973, 2338265; Feb. 6, 1974, 2405723
Int. Cl.² F16P *1/02*
U.S. Cl. 74—609 **10 Claims**

1. Flywheel assembly with anti-cracking safeguard for protection against overspeed, comprising a frusto-conical shaft portion, a flywheel mounted in a press-fitting engagement on said shaft portion and having a force applied thereto directed toward the end of the frusto-conical shaft portion having the smaller diameter, and a catching and centering device for said flywheel located adjacent said flywheel.

3,960,035

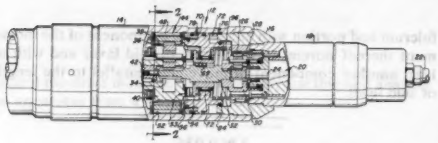
TORQUE RESPONSIVE SPEED SHIFTING MECHANISM FOR POWER TOOL

William Workman, Jr., and Joseph F. Carter, both of Spring Lake, Mich., assignors to Gardner-Denver Company, Dallas, Tex.

Filed Nov. 1, 1974, Ser. No. 519,975
Int. Cl.² F16D *25/00, 13/22, 43/20*; F16H *57/10*
U.S. Cl. 74—785 **11 Claims**

1. In a tool for tightening threaded fasteners and the like:

a housing;
a motor disposed in said housing;
a rotor member drivably connected to said motor;
a driven spindle;
a speed shift mechanism interconnecting said rotor member and said driven spindle and operable to reduce the speed of said driven spindle with respect to said rotor member, said mechanism including a torque responsive clutch having driving and driven members, one member being movable with respect to the other member for disengaging said clutch to cause said speed shift mechanism to reduce the speed of said driven spindle with respect to said rotor member;
said clutch including cooperable interfitting teeth disposed on said driving and driven members and responsive to torque transmitted from one member to the other to cause a separating force acting to move said one member with respect to said other member from a first engaged position to a second engaged position, said teeth being cooperable in said second engaged position to transmit



torque from said driving member to said driven member without causing further movement sufficient to disengage said clutch;
a piston connected to said one member for movement with said one member, said piston being disposed in said housing to form first and second expansible chambers;
means for conducting pressure fluid to said first chamber to act on said piston for biasing said one member into engagement with said other member;
first closure means responsive to movement of said one member to said second engaged position to vent said first chamber to reduce the pressure fluid force acting on said piston;
second closure means responsive to movement of said one member to said second engaged position for causing said second chamber to change from a vented condition to a substantially closed condition; and,
means for conducting pressure fluid to said second chambere to act on said piston for moving said one member to disengage said clutch when said second chamber is in a substantially closed condition.

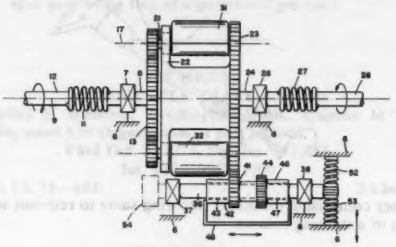
3,960,036

TORQUE CONVERTER

Paul S. Moller, Dixon, Calif., assignor to Discojet Corporation, Davis, Calif.

Filed Mar. 26, 1975, Ser. No. 562,014
Int. Cl.² F16H *1/28, 35/02*
U.S. Cl. 74—802 **8 Claims**

1. A torque converter comprising a driving gear rotatable about a primary axis, a driven gear rotatable about said primary axis, a first planetary shaft mounted on said driven gear coaxially with a secondary axis parallel to and radially spaced from said primary axis, a first planetary gear rotatable about said second axis and meshing with said driving gear, a first weight eccentric to and rotatable around said secondary axis, means for coupling said first weight and said first planetary gear for rotation together, a torque shaft, means for mounting said torque shaft for limited rotation, a first pinion engagable



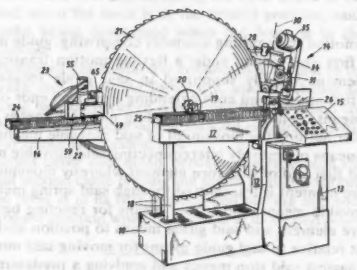
with said driven gear, and a first unidirectional clutch connectable to said torque shaft and said first pinion.

3,960,037

MACHINE FOR TREATING TEETH OF SAW BLADES

Otto Stier, Biberach an der Riss, Germany, assignor to Vollmer Werke Maschinenfabrik GmbH, Biberach an der Riss, Germany

Filed Mar. 18, 1975, Ser. No. 559,645
Claims priority, application Germany, Mar. 18, 1974, 2412938; Mar. 18, 1974, 2412939
Int. Cl.² B23D *63/12*
U.S. Cl. 76—43 **12 Claims**



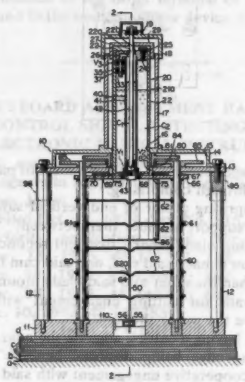
1. A machine for treating, in particular sharpening, the teeth of circular saw blades, comprising a base, bearing means for centrally mounting a circular saw blade, a feed means for turning the saw blade stepwise by a toothpitch or by a multiple of said tooth-pitch and treating means working in timed coordination with said feed means, said feed means being supported diametrically opposite from said treating means in relation to said bearing means, wherein said feed means and said bearing means are supported for displacement on common guide means, mounted on said base and extending diametrically to a circular saw blade mounted in said bearing means, and common setting drive means on said guide means for displacing said feed means and said bearing means along said guide means in the ratio of 2:1.

3,960,038

FABRIC-MARKING APPARATUS

Ichiro Okada, 7-1, 1-chome, Ookayama, Meguro, Tokyo, Japan

Filed Oct. 3, 1975, Ser. No. 619,380
Claims priority, application Japan, Oct. 8, 1974, 49-115936
Int. Cl.² B43K 5/00
U.S. Cl. 81—9.22 2 Claims



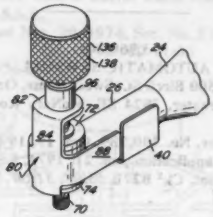
1. A fabric-marking apparatus having a frame, a cylindrical ink tank vertically supported on the frame and filled with marking ink, drive means for vertically reciprocating the ink tank in the axial direction, and an elongate hollow tubular piercing needle vertically reciprocated with the tank and bored with a lengthwise extending ink passage, characterized in that said apparatus further comprises an end block fitted to the upper end of the tank in airtightness; an elongate cylinder open at both ends, fixed to the end block in airtightness, received concentrically in the tank, and provided in the lower end side wall with communication aperture means for allowing the flow of marking ink between the interior spaces of the cylinder and tank; an elastic valve member provided with an integral cylindrical portion elastically pressed against the lower end inner wall of the cylinder normally to close the communication aperture means and fitted in a liquid-tight state between the lower open end of the cylinder and the bottom section of the tank; fine communication aperture means bored at the center of the elastic valve member, normally closed by its own elastic force, and, where required, designed to conduct marking ink held in the cylinder to the tubular needle through an ink discharge port formed in the bottom section of the tank; and an elongate plunger concentrically extending through the cylinder, the upper end of said plunger being supported on a frame and the lower end thereof penetrating the end block in airtightness, whereby, when the plunger is drawn out of the cylinder at its descent, the resultant decreased pressure in the cylinder causes the cylindrical portion of the elastic valve member to open the communication aperture means, allowing marking ink to flow into the cylinder, and, when the plunger is brought into the cylinder at its rise, the resultant increased pressure in the cylinder causes the fine communication aperture of the elastic valve member to be opened against its elastic force, allowing marking ink to be ejected.

3,960,039

COLLET WRENCH

John E. Nash, Downingtown, and Trevor D. Reader, King of Prussia, both of Pa., assignors to Star Dental Manufacturing Co., Inc., West Conshohocken, Pa.

Filed Aug. 12, 1974, Ser. No. 496,604
Int. Cl.² B25D 23/142
U.S. Cl. 81—52.4 R 13 Claims



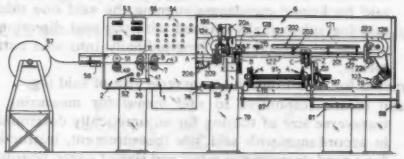
1. A wrench adapted to be hand-held comprising a shaft, said shaft having one end configured to be received in a threaded, rotatable securing device, said end being adapted to cause the rotating of said securing device when said end is rotated, the other end of said shaft having a first disc secured thereto, said first disc having teeth formed in the upper surface thereof, a second disc overlying said first disc, and being rotatable relative to said shaft, said second disc having teeth which are complementary with the teeth in said first disc on the under surface thereof, spring means urging said second disc into contact with said first disc, and means for rotating said second disc, said rotating means comprising a cylinder, said cylinder having a plurality of legs projecting downwardly therefrom, said legs being engaged in slots in said second disc, said spring means having a force sufficient to cause the rotation of said first disc when said second disc is rotated, and said spring means permitting rotation of said second disc relative to said first disc when a predetermined rotational force has been applied to said securing device.

3,960,040

METHOD FOR PRODUCING ELECTRICAL CONDUCTORS OF MEASURED LENGTH

Ragnar Gudmestad, West Allis, and Sven O. Sandblom, Greendale, both of Wis., assignors to Artos Engineering Company, New Berlin, Wis.

Division of Ser. No. 513,937, Oct. 10, 1974, Pat. No. 3,927,590. This application Sept. 15, 1975, Ser. No. 613,351
Int. Cl.² B26D 7/14, 5/12
U.S. Cl. 83—18 3 Claims



1. The method of producing electrical conductors of measured length from a continuous supply wire, which comprises the steps of:

feeding said supply wire through a cutting zone by pushing it lengthwise toward one side and simultaneously guiding it lengthwise away from the other side of said cutting zone;

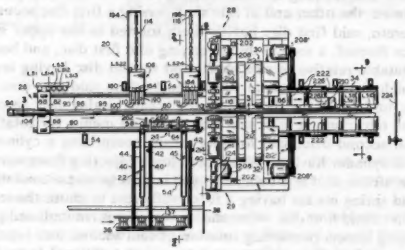
stopping said supply wire from advancing and locking it against endwise displacement after a measured length thereof has been advanced through said cutting zone;

tensioning said measured length of said stopped supply wire;
clamping said tensioned measured length of supply wire to a propelling conveyor at said other side of said cutting zone;
severing said supply wire in said cutting zone; and
indexing said propelling conveyor so as to move the tensioned severed length of said supply wire sidewise at said other side of said cutting zone.

3,960,041
AUTOMATIC SAWMILL

Lyle D. Warren, 500 Birch St., Sweet Home, Oreg. 97386, and Robert W. Brewster, 5924 SE. McNary Road, Milwaukie, Oreg. 97222

Division of Ser. No. 190,589, Oct. 19, 1971, Pat. No. 3,811,487. This application Jan. 21, 1974, Ser. No. 434,903
Int. Cl.² B27B *15/08, 31/00*
U.S. Cl. 83—361 **7 Claims**

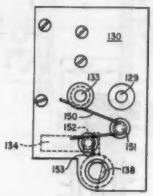


1. Sawmill apparatus comprising:
cutting means,
means for moving a tapered log substantially longitudinally into said cutting means for severing said log into one or more cants, boards, or slabs, with one side of said log substantially aligned with said direction of movement and with sides of said one or more cants, boards, or slabs, said means for moving comprising a carriage for receiving said log, and including backstand means for determining the transverse position of said log relative to said carriage, said backstand means maintaining the said one side of said log substantially aligned with the said direction of movement substantially longitudinally into said cutting means,
means for measuring the transverse size of said log,
and means responsive to said means for measuring the transverse size of the log for automatically determining, in accordance with said size measurement, instructions for a predetermined number and size of cants, boards, or slabs obtainable from said log starting at a datum plane proximate and parallel to said one side of said log and at an angle with respect to the other side of said log for efficiently utilizing the content of said log and for producing transverse relative movement between the transverse position of said log and the transverse position of said cutting means in response to said instructions to establish the relative position and symmetry of said log relative to said cutting means to produce said predetermined number and size of cants, boards, or slabs as said log is moved longitudinally into said cutting means.

3,960,042
MICROFICHE READER-PRINTER

Emil Tiger, Highland Park, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Division of Ser. No. 414,064, Nov. 8, 1973, Pat. No. 3,899,248. This application Dec. 23, 1974, Ser. No. 535,478
Int. Cl.² B26D *7/26, 5/08;* **B23D** *15/04*
U.S. Cl. 83—583 **8 Claims**

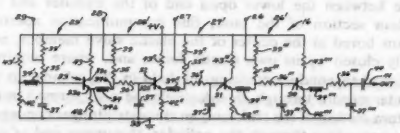


1. A rotary paper cutter for cutting a sheet of paper horizontally fed therethrough comprising:
a frame comprising a pair of end vertical sidewalls and a horizontal support member therebetween;
a rotary cutting blade having first and second ends and a traveler cam at each said end, one said cam being smaller in radius than the other and said blade mounted between said sidewalls for cutting engagement with the paper sheet above the paper sheet;
a cutting bar having a cutting edge on the near end thereof, said cutting edge being disposed beneath said cutting blade for cooperative engagement with said blade to cut a paper sheet therebetween, said bar having first and second ends, said first end being mounted to one said sidewall about a pivot at the far end of said bar and arranged for arcuate movement about said pivot, and said second end being mounted at the other said sidewall and arranged for horizontal movement only; and
means at each said bar end for urging said bar ends against said blade cams, said different cam radii causing said blade to overlap said bar by a desired amount;
whereby, the independent mounting of said bar ends assures the maintenance of said desired overlap notwithstanding inadvertent torsional forces applied to said frame.

3,960,043
FILTER CIRCUIT

John R. Brand, Mount Prospect, Ill., assignor to Warwick Electronics Inc., Chicago, Ill.

Filed June 24, 1974, Ser. No. 482,063
Int. Cl.² G10H *1/00, 5/00*
U.S. Cl. 84—1.19 **11 Claims**



1. In an electronic musical instrument having a plurality of tone generators, keyers for keying signals generated by said tone generators, and an electromechanical transducer for producing output sounds corresponding to the keyed signals, circuit means for effectively eliminating undesirable keying transients introduced into said signals by the keying thereof, comprising a multistage bandpass filter connected between said keyers and said transducer wherein each stage is provided with a single inductive impedance element and provides a band width having substantially abrupt drop-off at the oppo-

site ends thereof preselected to filter cleanly from the keyed signals delivered thereto from said keyer frequencies which are below and above the desired audio frequency spectrum of the output sound, the output impedance of each stage being lower than the input impedance of each stage, the band width being different for different stages, said filter stages respectively defining means for substantially equally attenuating high frequency components of said input keyed signals delivered to each of said input portions, and differently attenuating low frequency components thereof, each filter stage including a semiconductor device connected to the keyers, means for connecting one terminal of the inductive impedance element to said semiconductor device, and a capacitive impedance element connected to the other terminal of said inductance impedance and to the semiconductor device of the succeeding filter stage.

3,960,044
KEYBOARD ARRANGEMENT HAVING AFTER-CONTROL SIGNAL DETECTING SENSOR IN ELECTRONIC MUSICAL INSTRUMENT

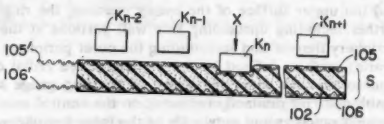
Yohei Nagai, and Kiyoshi Kawamura, both of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Oct. 17, 1974, Ser. No. 515,541

Claims priority, application Japan, Nov. 2, 1973, 48-126553; Nov. 15, 1973, 48-131242; Oct. 18, 1973, 48-120990; Oct. 18, 1973, 48-120991; Dec. 10, 1973, 48-140780; Dec. 10, 1973, 48-140781; Dec. 10, 1973, 48-140782; Dec. 10, 1973, 48-140783

Int. Cl.² G10H *1/00*

U.S. Cl. 84—1.01 **7 Claims**



1. A keyboard arrangement in an electronic musical instrument, comprising:

a plurality of keys pivotably supported and arranged in juxtaposed relationship, said keys being manually movable toward and away from a sensor means, and

an after-control signal detecting sensor means positioned at a distance from said keys and extending in transverse direction of the direction of movement thereof keys to correspond to all of these keys,

said sensor means comprising a flexible conductive pressure transmitting member serving as a first electrode member facing the bottoms of said keys at said distance therefrom,

a conductive base member serving as a second electrode member, and

a conductive flexible and elastic member extending below a number of said keys, with said first and second electrode members embedded therein at positions close to opposite surfaces of said elastic member,

said conductive flexible and elastic member being made of a flexible and elastic material containing conductive particles dispersed therein and exhibiting a difference in electrical resistance between the state in which this member is compressed and deformed and the state in which it is not compressed and deformed,

said first electrode member being adapted to flex itself when pressed by at least one of said keys to transmit to the conductive flexible and elastic member the pressures received from said at least one key of the keyboard to cause compression and deformation of the conductive flexible and elastic member in proportion to the magnitude and amount of said pressure thereby varying its resistance,

said two electrode members being connected to input terminals of an electric circuitry of said instrument to input said varying resistance as an after-control signal.

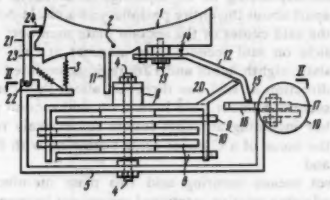
3,960,045
REGISTER SWITCHING DEVICE FOR A REED MUSICAL INSTRUMENT

Georgy Sergeevich Petrushevsky, and Valentina Sergeevna Petrushevskava, both of Bulvar Karla Marxa, 13/3, kv. 74, Kishinev, U.S.S.R.

Filed Nov. 20, 1974, Ser. No. 525,652

Int. Cl.² G10D *1/00*

U.S. Cl. 84—376 SM **9 Claims**



1. A register switching device for a reed musical instrument, said register switching device comprising a pivotal finger-actuated register key adapted to be set in first and second positions, a first pivotable lever, displaceable register strips positioned for engagement by said lever for movement thereby for control of the register of the musical instrument, said key including a pusher positioned to pivot said lever when the key is moved into said first position, a second lever displaceably mounted on said key and movable therewith as said key is pivotably moved, said second lever being in an initial position operatively juxtaposed with said first lever when said key is in said second position, an auxiliary key movable by an operator between operative and inoperative positions, said auxiliary key being positioned to displace said second lever as the auxiliary key moves from its inoperative to its operative position and when the second lever is in said initial position, said second lever under the action of the displacement thereof causing said first lever to pivotably move and displace said register strips.

3,960,046
MUSIC TEACHING DEVICE

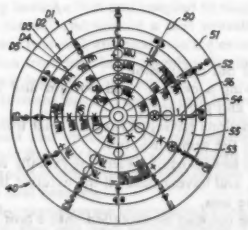
Alan Chong Seong Choong, Flat 14, 2 Grattan St., Hawthorn, Victoria, Australia

Filed Dec. 16, 1974, Ser. No. 532,844

Claims priority, application Australia, Dec. 18, 1973, 6049/73; Apr. 8, 1974, 7185/74

Int. Cl.² G09B *15/02*

U.S. Cl. 84—471 R **18 Claims**



1. A music teaching device comprising:

a first plate member having at least one separate indicium at each of 12 regions, which regions are spaced substantially at a common radius from a common center and are positioned at locations corresponding to 12 equiangular divisions spaced 30° apart about the entire periphery of a circle defined about said center;

indicia at first, third, fifth, sixth, eighth, 10th and 12th ones of the regions, counted in one direction about said center, including numerals indicating respective degrees of a major musical scale;

a second plate member being provided having at least one separate indicium at each of 12 regions defined thereon, these regions being spaced substantially at a common radius from a common center and positioned at locations corresponding to 12 equiangular divisions spaced 30° apart about the entire periphery of a circle defined about the said center of the second plate member;

indicia on said second plate member at first, third, fifth, sixth, eighth, tenth and 12th regions, counted in the same direction as said one direction about said center of said second member, said indicia on said second plate member including alphabet letters respectively representing the notes of a C major scale beginning with the letter C; and

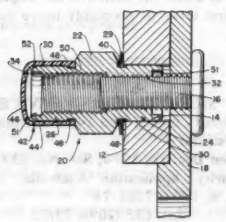
pivot means securing said two plate members together allowing relative rotational movement between the members about a common axis passing through their respective centers.

3,960,047

DUAL SIZE LUG NUT

Fenton A. Liffick, Granada Hills, Calif., assignor to Cragar Industries, Inc., Compton, Calif.

Filed Sept. 9, 1974, Ser. No. 504,208
Int. Cl.² F16B *27/00*
U.S. Cl. 85—32 R **5 Claims**



1. Dual size nut comprising:

a body having a central head portion and axially aligned opposite end portions,

said end portions having threaded, axial bores of different thread of the same direction

said central head portion extending radially beyond the end portions, and having flats on the exterior thereof circumjacent the axis,

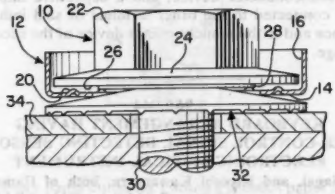
whereby the nut may be threaded onto a bolt, screw, or stud of either of two threads to secure a wheel to a hub wherein said end portions have external round surfaces adapted to fit within a bolt hole of said wheel.

3,960,048

FASTENER ASSEMBLY FOR CREATING ACCURATE TENSION INDICATING FASTENER AND METHOD OF CALIBRATING THE SAME

David Prugh Wagner, Geneva, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Mar. 28, 1975, Ser. No. 563,288
Int. Cl.² F16B *31/02, 39/24*
U.S. Cl. 85—62 **10 Claims**



1. An intermediate product relating to a fastener unit capable of accurately indicating a predetermined tension in a fastened joint, including a rotary fastener member having a central axis and predetermined radial dimension, a generally planar bearing surface beneath said fastener member, a conical-like spring washer preassembled to said fastener member and ring gauge member preassembled to the fastener member and spring washer with an inwardly extending flange interposed between the bearing surface of the fastener member and the upper surface of the spring member, the ring gauge further including upstanding side wall portions at the outer periphery thereof and surrounding the outer periphery of the bearing surface defined by the predetermined radial dimension so that the inner periphery of the ring gauge will be positioned and retained concentric to the central axis of the fastener member and outwardly of the inner periphery of the spring washer, the bearing surface of the fastener member being provided with a recess of predetermined height at the outer peripheral margin thereof and adapted to receive the flange of the gauge member therein, the ring gauge member being of a softer material than the material of the fastener member and the spring washer, the flange of the ring gauge including means capable of being compressed and permanently deformed, the compressible means providing a thickness dimension in that region of the flange which is greater than the predetermined height of the recess, whereby the intermediate product may be preloaded to a predetermined axial compression of the spring washer thereby creating a spring washer member capable of subsequent compression in direct relationship to load and eliminating, by permanent deformation of the means on the flange to a design thickness, any potential inaccuracies in the tension indicating capabilities of the unit due to variances from the design flange thickness.

3,960,049

REINFORCEMENT OF CAST OR PRESSED EXPLOSIVES

John H. Smith, Seaford, and George S. Rogers, Williamsburg, both of Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

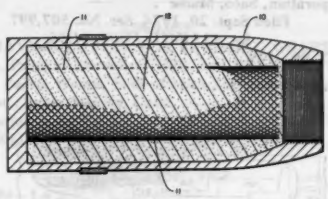
Filed Mar. 19, 1975, Ser. No. 559,858
Int. Cl.² F42B *13/00*
U.S. Cl. 86—20 B **2 Claims**

1. A method of reinforcing explosives against cracking comprising:

pouring a melted inert filler into a base of an ordnance item;

inserting one end of a pre-formed material of high strength and low stretch into said molten pool;

cooling said molten pool to fix the pre-form in its desired orientation;



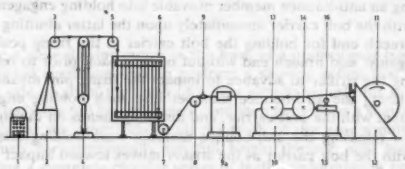
pouring melted explosive into the ordnance item; and cooling said explosive.

3,960,050

METHOD OF MAKING IMPREGNATED BRAIDED ROPE

Robert Eisler, Montreuil, France, assignor to Cordes Europe France, France

Filed July 17, 1974, Ser. No. 489,300
Claims priority, application France, Aug. 1, 1973, 73.28247
Int. Cl.[2] D04C *1/12*
U.S. Cl. 87—1 **7 Claims**



1. A method of making braided ropes of aromatic polyamide fibers in a manner to provide high strength, little elongation and high flexibility and which are resistant to deterioration comprising the steps of: providing a plurality of strands of aromatic polyamide fibers, braiding said fibers together to form a rope, impregnating said braid with an aqueous dispersion of a flurocarbon resin, heating said rope to remove moisture therefrom, applying a predetermined tension on said rope, and removing said rope.

3,960,051

EJECTION LAUNCH MECHANISM

William E. Hunt, North Andover, Mass., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 7, 1974, Ser. No. 512,377
Int. Cl.[2] F41F *3/06*, *5/02*
U.S. Cl. 89—1.8 **12 Claims**

1. A mechanism for use in an aircraft missile holding and ejecting system of the type comprising missile ejecting rams means operable by high pressure fluid, said mechanism comprising:

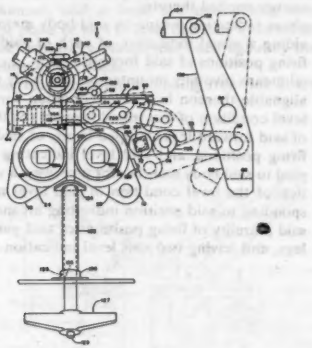
a body adapted to be fixed to missile support structure, said body defining a cylinder bore;

a piston reciprocable in said bore between first and second positions;

a bell crank lever having first and second legs and mounted for rotation with respect to said body about a first pivot, said first leg being connected to said piston so that movement of said piston effects said rotation of said bell crank lever;

a latch hook lever mounted for rotation with respect to said support structure about a second pivot spaced from said first pivot, said latch hook lever having a hook portion extending below said second pivot and presenting a load bearing surface;

a rigid link connected at one end by a third pivot to said second leg of said bell crank lever and connected at the other end by a fourth pivot to said hook portion of said hatch hook lever;



passage means, defined in said body, for conducting high pressure fluid into said bore to move said piston from said first to said second position, whereby said bell crank lever is rotated in a first direction to cause said link to pull said hook portion of said latch hook lever toward said body and out of engagement with a load on said load bearing surface.

3,960,052

WEAPON ARRANGEMENT

Matthew S. Smith, 4400 Sarah St. No. 29, Burbank, Calif. 91505, and Ernest A. Filippi, 18776 Kenya St., Northridge, Calif. 91324

Division of Ser. No. 307,444, Nov. 17, 1972. This application Oct. 18, 1974, Ser. No. 516,037
Int. Cl.[2] F41C *29/00*
U.S. Cl. 89—37 BA **3 Claims**

1. In a weapon system arrangement comprising a rocket boosted warhead round having a center of gravity, a center of pressure and a predetermined non-yawing frequency, and a launcher for launching the round, the improvement comprising, in combination:

a launcher comprising a tripod support, a barrell portion and means for firing a blank cartridge to direct the products of combustion from the fired blank cartridge through the barrel portion, and said tripod support comprising:

a body member;

a base leg having a first end coupled to said body member and a second end spaced a first preselected distance from said first end, and said base leg extending in a first direction from said body member for the condition of said base leg in a firing position;

a pair of forward legs and each of said forward legs having a first end pivotally coupled to said body member and a second end spaced a second preselected distance from said first end thereof, and said pair of forward legs in a predetermined spaced relationship to each other and to said base leg;

forward leg clamping means engaging each of said pair of forward legs and said body member for detachably clamping each of said forward legs in any of a plurality of firing positions on said body member;

launcher support means having a first end coupled to said

body member, and a second end spaced therefrom, and said launcher support means extending from said body member in a second direction;

launcher clamping means coupled to said second end of said launcher support means for detachably coupling said launcher thereto;

recoil energy dissipation means coupled to said launcher support means for dissipating at least a portion of recoil energy applied thereto;

position indicating means on said body member for providing a visual indication of each of said plurality of firing positions of said forward legs;

level means pivotally mounted on said body member and alignable thereon in a level condition for depicting a level condition of the tripod support for the condition of said forward legs clamped in any of said plurality of firing positions, and said level indicating means coupled to said body member for providing a visual indication of the level condition of said level means corresponding to said position indicating means for each of said plurality of firing positions of said pair of forward legs, and having two axis level indication means comprising a pair of bubble sight levels orthogonally aligned;

round for launching from said launcher and comprising:

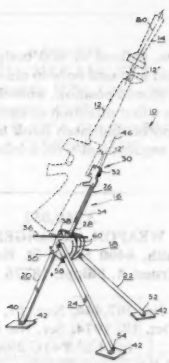
a tubular tailpipe means having an aft end, a forward end, and internal walls defining a tubular passageway, and said tubular passageway at said aft end adapted to slidingly fit onto the end of the launcher barrel;

a rocket motor having an aft end coupled to said forward end of said tailpipe, and a forward end, and comprising a solid propellant rocket grain;

a warhead coupled to said forward end of said rocket motor, and said warhead having a predetermined ogive external configuration;

a delay means in said rocket motor for providing a predetermined delay to full thrust of said rocket motor,

aero-gyro stabilization means coupled to said aft end of said tubular tailpipe for spinning said round to provide aero-gyro stability, said aero-gyro stability comprising wherein said center of pressure is aft of said center of gravity and the round is spinning at a rate at least of one order of megnitude greater than said predetermined non-spinning yawing frequency.

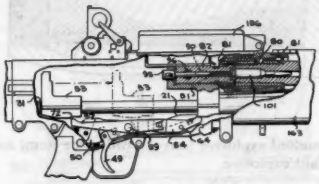


3,960,053

AUTOMATIC FIREARM HAVING ANTI-BOUNCE SEAR

James F. Conley, Kennebunk, Maine, assignor to Maremont Corporation, Saco, Maine

Filed Sept. 20, 1974, Ser. No. 507,997
Int. Cl.² F41D *11/02, 11/06*
U.S. Cl. 89—149 4 Claims



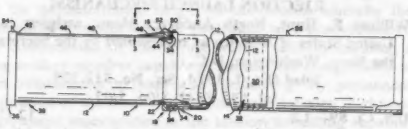
1. An anti-bounce mechanism for an automatic firearm having a receiver housing, a barrel having a breech end in said housing, a bolt carrier which advances along a path in the receiver housing to a firing position abutting the breech end of the barrel, a firing pin carried by the bolt carrier, and a striker which advances in the receiver housing toward the bolt carrier to impact the firing pin and fire a round of ammunition positioned in the barrel, said anti-bounce mechanism comprising an anti-bounce member movable into holding engagement with the bolt carrier immediately upon the latter abutting said breech end for holding the bolt carrier in the firing position against said breech end without bounce-back prior to releasing the striker to advance to impact the firing pin, means for biasing the anti-bounce member into such holding engagement with the bolt carrier, and disabling means on the striker for releasing the anti-bounce member from holding relation with the bolt carrier as the striker moves toward impact with the firing pin.

3,960,054

ANTI-TANK ROCKET LAUNCHER TELESCOPING TUBE LOCKING DEVICE

Lonnie L. Looger, Madison, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 23, 1974, Ser. No. 535,231
Int. Cl.² F41F *3/04*
U.S. Cl. 89—1.816 4 Claims



1. A lightweight man-transportable rocket launcher comprising:

a. first and second tubular sections connected to telescope between a shortened, inoperative position and an extended operative position, said second tubular section being mounted in said first tubular section;

b. a first sight carried on said first tubular section, and, a second sight carried on said second tubular section; and,

c. locking assembly means carried by said sections for securing said sections in said extended position and for preventing relative rotation therebetween whereby said sights will be maintained in alignment; said locking assembly means including a locking member carried on said second tubular section, said locking member having a dove-tail portion at one end thereof, and, a retaining ring secured to the aft end of said first tubular section, said

retaining ring having a dove-tail groove on the inner surface thereof to receive said dove-tail portion of said locking member.

3,960,055

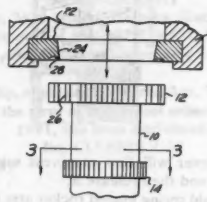
SHAVING CUTTER FOR FINISHING GEARS

Joseph A. Psenka, Bloomfield Hills, and Richard W. Tersch, Grosse Pointe Woods, both of Mich., assignors to Lear Siegler, Inc., Santa Monica, Calif.

Continuation-in-part of Ser. No. 270,678, July 11, 1972, Pat. No. 3,803,977. This application Jan. 28, 1974, Ser. No. 437,538

Int. Cl.² B23F *19/08*

U.S. Cl. 90—1.6 A **2 Claims**



1. A gear shaving cutter in the form of a unitary gear body designed simultaneously to perform a shaving action first at one side of all of the teeth of a gear simultaneously for substantially the full height thereof, and then to perform a shaving action at the other side of all the teeth of the gear simultaneously for substantially the full height thereof, said body having a complete circular series of teeth conforming in profile to the profile desired on the finished teeth of the gear, said teeth having a maximum thickness measured circumferentially of the cutter which is less than the circumferential spacing between adjacent gear teeth measured at the same radial distance from the centers of the gear and body, said cutter teeth having cutting edges only at one end thereof and at both sides of the teeth, both sides of the cutter teeth being inclined to provide cutting clearance behind both of the cutting edges, said cutter teeth accordingly being of diminishing thickness from the end thereof provided with said cutting edges to the other, whereby upon relative axial reciprocation between the shaving cutter and gear in coaxial relationship and in one direction only, shaving cuts may be taken from end to end of the gear teeth at one side thereof for substantially the full height thereof and by relative circumferential feed, shaving cuts may be taken at the other side of the gear teeth, the cutting edges of said cutter teeth being disposed at different axial spacings from a single reference plane perpendicular to the axis of the cutter to initiate cuts by different teeth at different times.

3,960,056

VERTICAL BROACHING MACHINE

Herbert Holstein, Solingen, and Armin Farrenkothen, Wuppertal, both of Germany, assignors to Oswald Forst Maschinenfabrik und Apparatebauanstalt GmbH, Solingen, Germany

Filed Dec. 24, 1974, Ser. No. 536,225

Claims priority, application Germany, Jan. 4, 1974, 2400236

Int. Cl.² B23D *37/10, 41/06*

U.S. Cl. 90—73 **6 Claims**

1. Vertical broaching machine, specifically an internal broaching machine, including:

at least one workpiece holder mounted on a machining table of the broaching machine;

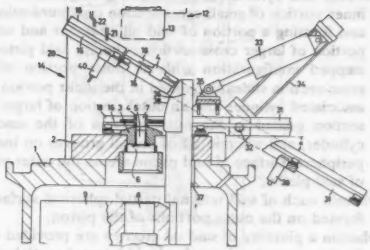
a vertically displaceable broaching slide mounted beneath said machining table for drawing a broach through a workpiece at the at least one workpiece holder;

a vertically displaceable broach feed slide mounted above the at least one workpiece holder;

at least one inclined feed channel for workpieces, said channel terminating in front of and above the at least one workpiece holder;

at least one mask extending up to one end of the at least one feed channel, said at least one mask being swivelable from the plane of said at least one feed channel to the at least one workpiece holder and back again by means of a swiveling drive means;

at least one ejection chute extending from the at least one mask;



at least one separating means mounted above the at least one feed channel, said at least one separating means being for moving between two end positions and releasing one workpiece to the at least one workpiece holder when the at least one mask in the raised position; and

at least one stop mounted on the broaching slide associated with each of the at least one each workpiece holders, said at least one stop projecting between the at least one mask and the at least one ejection chute, and, said at least one stop also blocking the at least one mask when the broaching slide is in the raised position and cutting the at least one mask off from the at least one discharge chute, and further said at least one stop releasing the at least one mask when the broaching slide is in the lowered position.

3,960,057

HYDRAULIC PUMP OR MOTOR

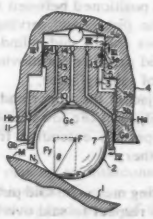
Eiji Kometani; Masaya Imai, both of Tokyo, and Eiichi Hazaki, Kashiwa, all of Japan, assignors to Hitachi Construction Machinery Co., Ltd., Japan

Filed Jan. 23, 1974, Ser. No. 435,954

Claims priority, application Japan, Jan. 26, 1973, 48-10322

Int. Cl.² F01B *31/10*

U.S. Cl. 92—160 **6 Claims**



1. A hydraulic pump or motor comprising:

a casing having a cam surface thereon,
a cylinder block mounted in the casing and having at least one cylinder,
a piston arranged in said cylinder for reciprocating movement therein and formed with an internal partial-spherical surface on an end portion thereof,
roller means rotatably mounted on the partial-spherical surface of said piston for rolling movement on the cam surface,
a plurality of oil grooves on the internal partial-spherical surface,
a plurality of oil grooves on outer peripheral surfaces of a portion of said piston which portion is guided in said cylinder,
and small diameter passages extending through said piston for connecting the respective oil grooves with an oil chamber,
wherein said cylinder is of stepped configuration with an inner portion of small cross-section communicating with and forming a portion of said oil chamber and an outer portion of larger cross-section, wherein said piston is of stepped configuration with an inner portion of small cross-section slideably guided in the inner portion of the associated cylinder and an outer portion of larger cross-section guided in the outer portion of the associated cylinder, and wherein all of the oil grooves on the outer peripheral surface of said piston are on the outer portions of said piston,
wherein each of said internal partial-spherical surfaces are formed on the outer portions of the piston,
wherein a plurality of said oil grooves are provided spaced from one another in each of said internal partialspherical surfaces,
wherein separate oil passages are provided on said piston between said oil chamber and each of the oil grooves on said internal partial-spherical surfaces, these last-mentioned separate oil passages each including narrow throttling necked portions, and
wherein a plurality of said oil grooves are provided spaced from one another on the outer peripheral surface of said piston,
wherein separate oil passages are provided in said piston between said oil chamber and each of the oil grooves on said outer peripheral surfaces,
wherein all of said oil passages are disposed in said piston.

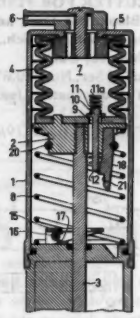
3,960,058

DEVICE AT HYDRAULIC MOTOR

Hans Berkelius, 36 Parkvagen, Taby, Sweden (S-18352)

Filed Dec. 10, 1974, Ser. No. 531,401
Claims priority, application Sweden, Dec. 12, 1973, 7316784
Int. Cl.² F01L *15/12, 21/04*
U.S. Cl. 91—224 **2 Claims**

1. A hydraulic motor device comprising in combination:
a. a cylinder having an upper end and a lower end,
b. a piston mounted for reciprocating movement away from and toward the upper end of said cylinder,
c. a spring means positioned between the lower end of said cylinder and the piston and serving to bias said piston toward the upper end of said cylinder,
d. a source of fluid pressure for moving said piston toward the lower end of said cylinder,
e. a fluid inlet adjacent the upper end of said cylinder and a fluid outlet adjacent the lower end of said cylinder,
f. an overflow aperture extending from one side of the piston to the other,
g. a stop valve,
h. resilient mounting means on said piston for mounting said stop valve with respect to said overflow aperture so that the stop valve can only alternate between a first completely closed position and a second completely open position,
i. a swing lever projecting outwardly from said piston toward the lower end of the cylinder,
j. a spring loaded rocker arm mounted adjacent the lower end of said cylinder,
k. said swing lever being mounted so that as the piston moves downwardly toward the lower end of the cylinder



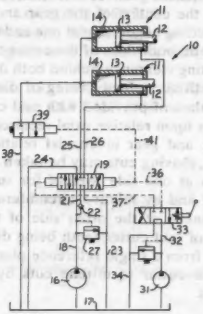
the swing lever will first compress said spring loaded rocker arm and then release it,
whereby when said spring loaded rocker arm is released it will impact against said stop valve and move it to the completely open position and said stop valve will not close until said spring means causes said stop valve to impact against the upper end of said piston.

3,960,059

FAST EXHAUST CIRCUIT FOR HYDRAULIC JACKS

Lawrence F. Schexnayder, Joliet, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Dec. 9, 1974, Ser. No. 530,621
Int. Cl.² F15B *11/04*
U.S. Cl. 91—443 **6 Claims**



1. A fast exhaust circuit for hydraulic jacks, comprising:
a hydraulic jack having a head end and a rod end;
a source of fluid including a fluid reservoir, a pump, and a conduit communicating the pump with said reservoir;
conduit means for communicating said hydraulic jack with said pump and said reservoir;
a control valve disposed in said conduit means for selectively directing pressurized fluid through said conduit means from said pump to the rod end of said hydraulic jack and transmitting fluid exhausted from the head end of said hydraulic jack to said reservoir;
a bypass conduit connecting said conduit means adjacent to said hydraulic jack with said reservoir; and
a fluid pressure actuated bypass valve disposed in said bypass conduit normally positioned for blocking fluid flow

therethrough so that all fluid exhausted from the head end of the hydraulic jack passes through and is modulatably controlled by said control valve, said bypass valve being selectively positionable by directing pressurized fluid thereto to establish communication through the bypass conduit for returning a portion of the fluid exhausted from the head end of the hydraulic jack through the bypass valve and the bypass conduit directly to said reservoir bypassing said control valve with said portion of the exhausted fluid passing through the bypass valve being larger than the portion passing through the control valve.

3,960,060

PRESSURE RESPONSIVE CONTROL BODY ARRANGEMENT

Karl Eickmann, 2420 Isshiki, Hayama, Kanagawa, Japan

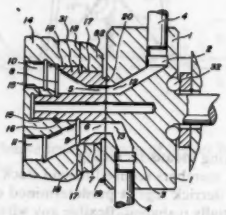
Continuation-in-part of Ser. No. 239,551, March 30, 1972, Pat. No. 3,831,496. This application July 10, 1974, Ser. No. 487,271

Claims priority, application Austria, Apr. 7, 1971, 2987/71

The portion of the term of this patent subsequent to Aug. 27, 1991, has been disclaimed.

Int. Cl.² F01B *1/00*

U.S. Cl. 91—487 **10 Claims**



1. In a fluid handling device, a combination comprising a housing having inlet and outlet ports for admission and evacuation of fluid and pressure chamber means communicating with said ports; a rotor mounted in said housing and provided at one axial end thereof with a first control face having a gravity center, said rotor also having a plurality of working chambers and passages extending between said working chambers and said control face; and a control body axially movably received in said pressure chamber means of said housing and having a second control face adjacent to and defining with said first control face a narrow control clearance, said second control face having a geometrical center and another gravity center said control body being urged toward said rotor by said fluid in said pressure chamber means and including at least one larger-diameter first at least partially cylindrical portion coaxial with said rotor and at least one smaller-diameter second cylindrical portion which is eccentric relative to the axis of said rotor, the distance between the gravity center of said first control face and the axis of the rotor being substantially equal to the distance between said gravity center of said second cylindrical portion and the axis of said rotor.

3,960,061

MOUNTING ARRANGEMENT FOR A HYDRAULIC MOTOR

John J. Campbell, Decatur, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Mar. 27, 1975, Ser. No. 562,612

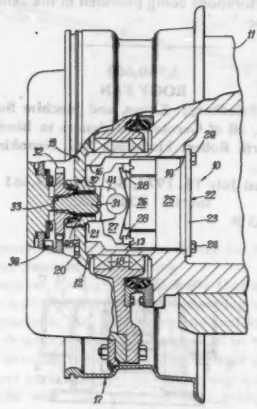
Int. Cl.² F01B *13/04*; B60K *3/00*

U.S. Cl. 91—506 **8 Claims**

1. A mounting arrangement for a variable displacement hydraulic motor having a pivotal swash plate and an axially extending drive shaft, comprising:

a hollow support structure having a bore formed therein with said bore having an open end for receiving the hydraulic motor;

an end wall secured to said support structure at an opposite end of said bore and having a pilot bore extending therethrough;



a mounting bracket journalled to said drive shaft and having a pair of spaced apart lugs extending toward the hydraulic motor and pivotally engaging the swash plate, and an annular pilot portion disposed coaxial with said drive shaft and piloted into said pilot bore; and

means for securing said mounting bracket to said end wall.

3,960,062

METHOD OF MAKING A BAND OF PLASTIC BAGS

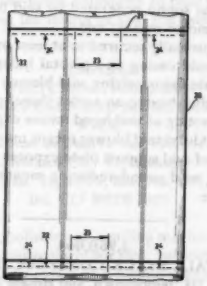
Arnoldus Willem Jan Leloux, Dedemsvaart, Netherlands, assignor to Wavin B.V., Zwolle, Netherlands

Filed Sept. 30, 1974, Ser. No. 510,684

Claims priority, application Netherlands, Sept. 29, 1973, 7313440

Int. Cl.² B31B *49/04*

U.S. Cl. 93—35 R **5 Claims**



1. A method of making an interconnected band of plastic bags, comprising the steps of:

a. providing an elongated band of thermoplastic foil, the band having two superposed walls,

b. sealing the walls of the band together along longitudinally spaced-apart transverse seal lines,

c. piercing the band with longitudinally spaced-apart transverse lines of perforations, each line comprising a series of first perforations all of which are formed simultaneously, and

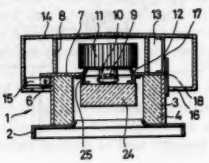
d. thereafter piercing the band along each line of perforations to form second perforations between the first perforations, the second perforations being provided only in two side sections of each line between a central section of the line and the longitudinal side edges of the band, no second perforations being provided in the central section of each line.

3,960,063

ROOF FAN

Franz Siemes, Friedberg; Kraus, and Joachim Buhl, both of Neunkirchen, all of Germany, assignors to Blech- und Metallwarenfabrik Robert Fischbach KG, Neunkirchen, Germany

Filed July 18, 1974, Ser. No. 489,461
Int. Cl.² F24F 7/02
U.S. Cl. 98—43 R **7 Claims**



1. A roof mounted fan, comprising:

a base having a first opening therein;

an upstanding casing mounted on said base and having a second opening therein communicating with said first opening;

a support plate having a third opening therein pivotally secured to said upstanding casing adjacent the upper end thereof for movement between a position across said open upper end of said casing perpendicular to an axis of said casing so that said third opening is aligned with said second opening and a position out of perpendicular alignment with said axis of said casing;

blower means and drive motor means therefor mounted on said support plate, said blower means having an axis of rotation coaxial with the axis of said third opening;

sound reducing means removably mounted in said upstanding casing between said base and said support plate for reducing the sound generated by said blower means and said drive motor means; and

hood means pivotally secured to at least one of said support plate and said casing and pivotal independently of said support plate for overlying said blower means and defining a chamber having an outlet therefrom;

whereby a pivoting of said hood means exposes said support plate and at least said blower means mounted thereon and a pivoting of said support plate exposes said sound reducing means, said sound reducing means being accessible from above.

3,960,064

TALL STACK CONSTRUCTION

John F. Straitz, III, Jenkintown, and Hosein M. Shakiba, Philadelphia, both of Pa., assignors to National Airoil Burner Company, Inc., Philadelphia, Pa.

Filed July 10, 1975, Ser. No. 594,749
Int. Cl.² E04H 12/20, 12/28; F23J 11/12
U.S. Cl. 98—60 **12 Claims**

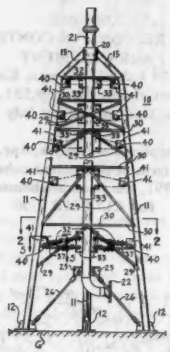
1. A vertical discharge stack assembly for dispersal of gaseous products which comprises

a vertical stack pipe,

a derrick for supporting said pipe and having at least three legs,

rigid supporting means for vertically supporting said stack pipe at a predetermined location along its length in fixed relation to said derrick, and

flexible restraining means interposed in connecting relation between said derrick and said stack pipe for restraining horizontal movement of said stack pipe,



said restraining means including

mounting members secured to said stack pipe and to one of said derrick legs at predetermined elevations, and

a substantially u-shaped, flexible guy wire having substantially horizontally extending portions, the free ends of which are attached to one of said mounting members while the looped end of said guy wire is attached to the other of said mounting members.

3,960,065

AIR CONTROL APPARATUS

Francis J. McCabe, 239 Hastings Court, Doylestown, Pa. 18901

Filed Jan. 20, 1975, Ser. No. 542,210
Int. Cl.² F16K 13/04
U.S. Cl. 98—40 D **5 Claims**

1. An air control apparatus comprising:

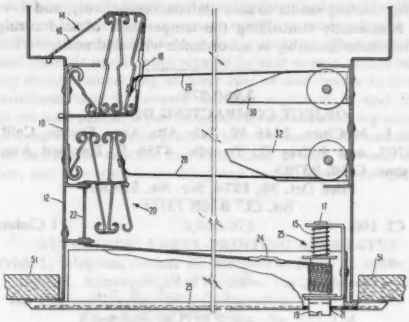
a. a frame having means providing a directed air passage therethrough;

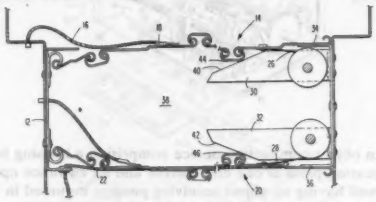
b. a plurality of sets of blades, each set having a plurality of blades articulated with respect to one another, so that each set can be moved between an open folded condition which allows air to pass through said frame and a closed unfolded condition which substantially restricts the passage of air through said frame; said sets being spaced from one another in said frame in the direction of said air passage therethrough;

c. at least one set of blades having volume controller means for adjusting the position of said blades between fully unfolded and fully folded at a plurality of positions and retaining it once it is adjusted; and

d. each of said sets being retained in their respective folded conditions by means coacting with releasable link means to release the blades of said set upon appropriate predetermined temperature conditions and permit the blades to move to a fully unfolded condition, closing said frame to the passage of air therethrough, and providing thereby, in

the fully closed condition, a space between said sets of blades which acts as an air buffer to reduce heat transfer





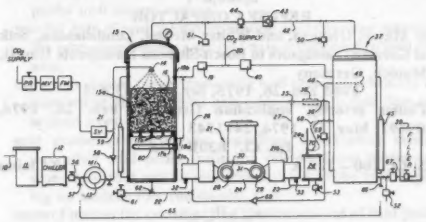
across said frame from a region of higher heat to a region of lower heat.

3,960,066

BEVERAGE PREPARATION APPARATUS

Thomas C. LaRocco, and Atlee M. Knorr, both of Apalachin, N.Y., assignors to Union Kol-Flo Corporation, Vestal, N.Y.

Filed June 19, 1975, Ser. No. 588,325
Int. Cl.² A23G 9/06
U.S. Cl. 99—323.2 **12 Claims**



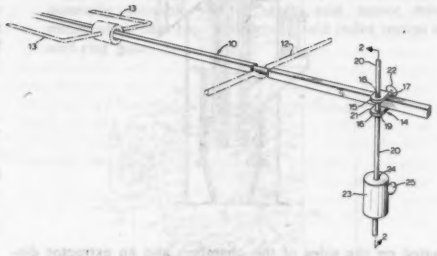
1. Apparatus for production of carbonated beverages, comprising, in combination: water chiller means connected to receive water from a supply line and operative to provide chilled water; carbonating means connected to receive chilled water from said water-chiller means and to carbonate the chilled water without further cooling it, said carbonating means comprising a first enclosed tank containing a filamentary metal mass and means for supplying carbon dioxide gas to said tank; a syrup supply reservoir; a second enclosed tank having an inlet conduit; and pumping means for simultaneously pumping metered amounts of chilled carbonated water from said first tank and syrup from said reservoir through said inlet conduit into said second tank, said second tank being adapted to be connected to a container-filling machine.

3,960,067

COUNTERBALANCE FOR ROTARY SPIT

Leslie G. Dutchburn, Toronto, Canada, assignor to Develpro Incorporated, Toronto, Canada

Filed Mar. 19, 1975, Ser. No. 559,958
Int. Cl.² A47J 37/04
U.S. Cl. 99—421 H **5 Claims**



1. An adjustable counterbalance device for a rotatable spit of a rotisserie assembly, comprising

a yoke member having a substantially U-shaped cross section including a shorter leg, a longer leg and an integral transverse web, said shorter leg and said longer leg being spaced from and substantially parallel to each other,

said yoke member having a U-shaped brace portion formed by a short portion of said shorter leg and longer leg immediate said web, said yoke member being slidably and transversely securable in a straddle manner on said spit with said spit received in said brace portion,

a first opening formed in said shorter leg,

a second, third and fourth opening formed in said longer leg,

a rod member securable on said yoke member selectively in a first, second and third position, whereby in said first position said rod member extends through said first opening and said second opening and is substantially perpendicular to said shorter leg; and in said second position said rod member extends through said first opening and said third opening and is skewed at substantially 65 degrees from said shorter leg; and in said third position said rod member extends through said first opening and said fourth opening and is skewed at substantially 45 degrees from said shorter leg,

an adjustable set screw provided at said web, said set screw being operative to cause said rod member and said yoke member to clamp securely on said spit, and

a weight member slidably secured on said rod member, said weight member being adjustable to position at a selected position along the length of said rod member.

3,960,068

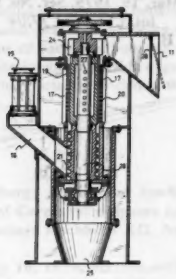
MACHINE FOR WHITENING, POLISHING OR PEARLING GRAINS AND CEREALS AND MORE PARTICULARLY RICE

Felipe Salete, Av. Ano de Juarez No. 198, Granjas San Antonio, Ixtapalapa, Mexico City 13, Mexico

Filed Jan. 29, 1975, Ser. No. 545,315
Int. Cl.² B02B 3/06
U.S. Cl. 99—606 **8 Claims**

1. A whitening, polishing or pearling machine for grains and cereals and more particularly for rice, vertically disposed and within which are integrated the mobile system for polishing, transmissions, motors and ventilation system, comprising an integral chamber with a lateral inlet for the grain, which is continued into a conduit which empties into the bottom of a substantially cylindrical treatment chamber composed of a hollow shaft which at its lower end communicates with a passage for air coming from a blower; the said hollow shaft extends upward and its upper part is enlarged discharging into a treatment chamber surrounded by a screen within which the

hollow shaft supports a screw conveyor and a rotor for impelling the grain; the latter is thrown against the screen and its movement is broken by vertical knife intensifiers of the work



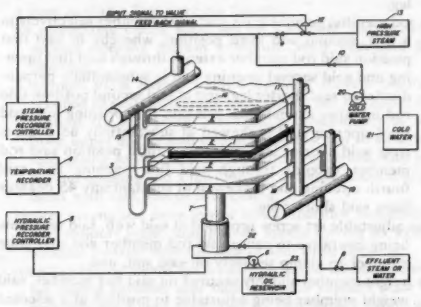
situated on the sides of the chamber; and an extractor disposed above the treatment chamber to discharge the grain elevated from the lower portion toward a lateral outlet in the upper right-hand of the machine.

3,960,069

METHOD AND APPARATUS FOR CONTROLLING A PRESS

Ralph Mitchell Bowyer, Cincinnati, Ohio, assignor to Formica Corporation, Cincinnati, Ohio

Filed Mar. 21, 1974, Ser. No. 453,449
Int. Cl.² B30B *15/34*
U.S. Cl. 100—38 **6 Claims**



1. A method of controlling the pressing of a laminate assembly wherein the assembly is placed between heatable platens of a press which is then closed subjecting the assembly to pressure comprising

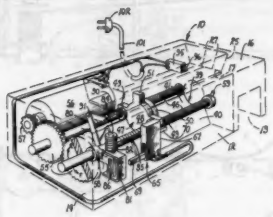
1. continually providing an output signal to a controller from a programmer in response to a desired time and temperature command profile,
2. continually measuring, solely at said assembly, the temperature of said laminate assembly being cured between the platens of the press,
3. continually providing said measured temperature to said controller,
4. continually determining the conformity of said measured temperature to the programmed temperature of said profile in conjunction with said time of said profile,
5. continually determining a need for a temperature change in said curing laminate assembly from said conformity determination,
6. continually providing first and second signals, each to one of a pair of relays and a third signal to a heat source from said programmer in accordance with said command profile which third signal energizes first means for introducing heating media to the platens and which first and second signals energize second means for removing heating media from said platens and third means for introducing cooling media to said platens, respectively, and
7. continually controlling the temperature of said curing laminate assembly in accordance with said need.

3,960,070

OBJECT COMPACTING DEVICE

David L. McClure, 2246 W. Palo Alto Ave., Fresno, Calif. 93705, and Jeffrey D. Tweedie, 4756 E. Harvard Ave., Fresno, Calif. 93703

Filed Oct. 30, 1974, Ser. No. 519,061
Int. Cl.² B30B *15/14*
U.S. Cl. 100—49 **11 Claims**



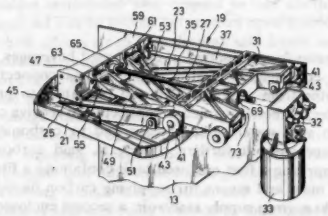
2. An object compacting device comprising a housing having a bearing plate at one end thereof and an entrance opening; a wall having an object receiving passage mounted in the housing in spaced relation to the bearing plate to divide the housing into an object receiving compartment communicating with the entrance opening and an object discharge compartment communicating with the receiving compartment through the receiving passage; a workbed secured on the housing in the receiving compartment in endward alignment with the receiving passage and in alignment with the entrance opening; a compression member; and means for transporting said compression member across the workbed to and from the receiving passage in response to the insertion of an object on to the workbed through the entrance opening.

3,960,071

REFUSE COMPACTOR

Rolf Mayer, Giengen, and Walter Menzel, Landshausen, both of Germany, assignors to Bosch-Siemens Hausgerate GmbH, Munich, Germany

Filed Feb. 26, 1975, Ser. No. 553,435
Claims priority, application Germany, Feb. 28, 1974, 2409491; Mar. 11, 1974, 2411543
Int. Cl.² B30B *1/18*
U.S. Cl. 100—229 A **10 Claims**



1. A refuse compactor, particularly for household refuse, comprising a supporting frame; an upwardly open container in said frame; a pressure platen movable into and out of said container; a parallellogram drive for said platen, including

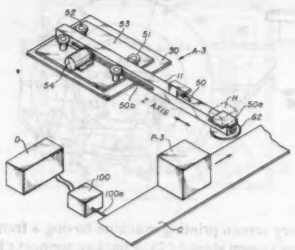
substantially horizontal guide means on said frame, a shiftable element movable along said guide means, at least two pair of levers mounted for pivoting about respective pivot axes and each having ends connected to said platen and to said shiftable element respectively, a screw spindle connected with said shiftable element and with a motor so as to effect shifting of said element upon being rotated by said motor, and reinforcing means connecting at least two of said levers to form a structural unit; a traverse member mounted in said frame above said platen; a pair of guide levers each having one end pivoted to one of said pairs of levers substantially midway of the same, and another end connected to said traverse member; and a bearing journalling one end of said screw spindle.

3,960,072

AUTOMATIC LABEL-PRINTING APPARATUS

Erick L. Ahlgren; Arthur H. McMorris; Jerry L. Mille, and Joseph L. Schweppe, all of Houston, Tex., assignors to Houston Engineering Research Corporation

Filed Feb. 24, 1975, Ser. No. 552,224
Int. Cl.² B41F *17/00*
U.S. Cl. 101—35 **17 Claims**



1. Apparatus for positioning a printing head for directly printing a label onto a package or the like, comprising:
- a probe unit supporting a printing head for movement therewith;
- probe mount means mounting said probe unit for movement along a first axis toward and away from a package;
- a carriage assembly supporting said probe unit and said probe unit mount means;
- second axis mount means mounting said carriage assembly for movement along a second axis orthogonal to said first axis;
- third axis mount means mounting said carriage assembly for movement along a third axis orthogonal to said first and second axes;
- said probe mount means including break-away means mounting said probe unit for release from movement along said first axis in response to said probe unit engaging an undesirable resistance; and
- control means for coordinating the movement of said probe unit along said first, second and third axes for positioning said probe unit and printing head to print a label directly onto said package.

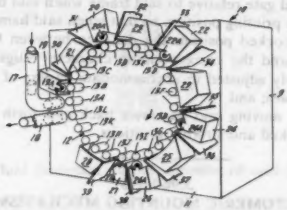
3,960,073

MACHINE FOR DECORATING TWO-PIECE CANS

John E. Rush, Geneva, N.Y., assignor to American Can Company, Greenwich, Conn.

Filed Mar. 10, 1975, Ser. No. 557,006
Int. Cl.² B41F *17/08*
U.S. Cl. 101—40 **17 Claims**

1. A machine for the decoration of cans and similar objects including a base
- a circular index table substantially vertically aligned and rotatably mounted relative to said base;
- a plurality of mandrels, means rotatably mounting each of said mandrels on said index table, a spur gear affixed to each of said rotatable mounting means;
- an index means having an intermittently movable output shaft to index said index table in an intermittent repeated movement and dwell rotative movement, said index means being driven by motor means;
- a ring gear independently rotatably mounted on said intermittently movable output shaft, said motor means mounted on said base and driving said index means and said ring gear;



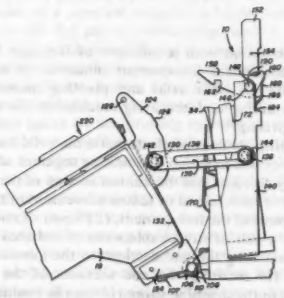
wherein said ring gear drives said spur gears;
- a plurality of work stations fixed to said base and arranged adjacent to the periphery of said index table;
- at least two of said stations including coating or printing rollers for the application of a material onto said cans, said rollers being driven by said ring gear;
- at least two of said work stations being drying stations to dry the material applied on the can at the coating and printing stations;
- whereby said index table and mandrels are driven in synchronism under each work station to achieve precise can registration.

3,960,074

LINE PRINTER HAVING HAMMER WHICH SPANS THREE PRINT POSITIONS

Albert S. Chou, Monte Sereno, Calif., assignor to Shugart Associates, Sunnyvale, Calif.

Filed Sept. 16, 1974, Ser. No. 506,405
Int. Cl.² B41J *1/20*
U.S. Cl. 101—93.14 **13 Claims**



1. A line printer for printing lines of print characters on a continuous paper form comprising:
- a band gate having a registration surface and having a latch pin;
- a recirculating character belt rotatably carried by said band gate, said belt having a plurality of character slugs affixed thereto;

a frame including a hammer bank having a plurality of hammers, each of said hammers having a face and being movable between a cocked position and striking position, each said face being positioned to strike one of said character slugs when said hammer is in said striking position, means for pivotally mounting said band gate to said frame so that said band gate may be rotated between a printing position and a paper form loading position, and latching means affixed to said frame and including a latch plate for engaging said latch pin to hold said band gate in said printing position and means for allowing incremental adjustment of said latch plate to vary the disposition of said band gate relative to said frame when said band gate is in said printing position so that when said hammers are in said cocked position the distance between the faces thereof and the corresponding character slugs may be selectively adjusted to accommodate papers of different thicknesses; and

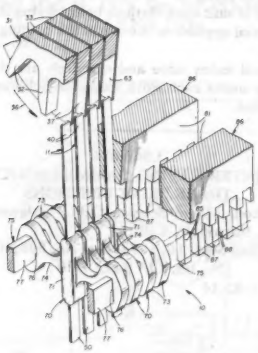
means for moving said hammers back and forth between said cocked and striking positions.

3,960,075

ELASTOMERIC MOUNTING MECHANISMS

Egon S. Babler, Northbrook, Ill., assignor to Teletype Corporation, Skokie, Ill.

Filed Mar. 24, 1975, Ser. No. 561,580
Int. Cl.² B41J 9/02
U.S. Cl. 101—93.48 **11 Claims**



1. In combination with a machine of the type having an elongated mechanical interponent mounted in a machine support frame for both axial and pivoting movements, an improved mounting and actuating mechanism for said interponent comprising:

a. a mounting element of elastomeric material having (1) a central section in which a mounting segment of the interponent is fixed so that the central section of the mounting element is constrained to follow movement of the mounting segment of the interponent, (2) a pair of end sections, and (3) a pair of stretchable webs of reduced cross section connecting the end sections to the central section;

b. means for securing the end sections of the mounting element in the machine support frame in positions spaced a distance such that the webs are longitudinally stretched predetermined amounts along a transverse mounting axis extending through the end sections, along the webs, and through the central section of the mounting element, so that the elastomeric material of the stretched webs mounts the interponent in a stable initial position and defines flexure joints on both sides of the interponent permitting both axial and pivoting movements of the interponent about the flexure joints and so that the material of the stretched webs exerts both linear and rotary spring forces tending to return the interponent to the initial position in the absence of external forces acting on the interponent; and

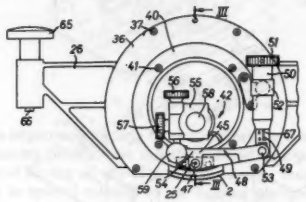
c. mechanical means for periodically engaging the interponent in the initial position and moving it axially and pivoting it about the flexure joints to an operated position and attitude and thereafter releasing the interponent, after which said spring forces return the interponent both axially and rotationally to the stable initial position.

3,960,076

ROTARY SCREEN PRINTING MACHINE WITH ANGLE AND PRESSURE ADJUSTABLE SQUEEGEE

Karl Wick, Biberist, Switzerland, assignor to Fritz Buser AG Maschinenfabrik, Wiler near Utzenstorf, Switzerland

Filed Feb. 25, 1974, Ser. No. 445,132
Claims priority, application Switzerland, Feb. 27, 1973, 2826/73
Int. Cl.² B41F 15/42
U.S. Cl. 101—119 **4 Claims**



1. A rotary screen printing machine having a frame, a cylindrical rotary screen stencil (2), a backup support (15) located to cooperate with the screen stencil (2) and to define a contact line therewith, a squeegee or doctor blade holder (4, 6) and a squeegee or doctor blade (7) attached thereto and located within the cylindrical screen;

bearing housings (26, 27) secured to the frame adjacent the respective ends of the screen stencil;

bearings (31) journalling the screen (2) located in the bearing housings;

and an adjustable blade support means (42, 43) supporting the blade holder (4, 6) and secured in the bearing housings at the respective ends of the screen for rotation independently of rotation of the screen, at least one of said adjustable blade support means comprising

a rotatable support ring (40, 40′) rotatably supported on the bearing housing (26, 27) for rotation independently of the screen;

a fulcrum pin (47, 47′) having a fulcrum axis (25, 25′) located above, and radially inwardly of the stencil (2), and closely adjacent to the contact line (8) of the screen (2) and the support (15);

a rocking lever (45, 46) swingably mounted on said fulcrum pin (47, 47′) to rock about said axis (25, 25′) and operatively connected to said blade holder (4, 6),

said fulcrum pin (47, 47′) being secured to the support ring (40, 40′) and supporting said rocking lever (45, 46) for rocking movement about the axis (25, 25′) of said fulcrum pin (47, 47′);

an adjustable spindle (49, 67) secured to the support ring (40) engaging the rocking lever (45, 46) and setting the position of the rocking lever (45, 46) with respect to the respective support ring (40);

a support block (55, 61) supporting said blade holder

height-adjustable means (56, 62, 63, 64) securing the blade holder support block (55, 61) to the rocking lever (45, 46) to adjust the distance of the support block (55, 61) and hence of the blade (7) from the contact line (8);

and wherein the rotatable support ring (40, 40') is concentric with the cylindrical rotary screen stencil (2), whereby said fulcrum pin, and said spindle, both secured to said rotatable support ring (40, 40') will be rotatable with respect to the bearing housing (26, 27), and thus rotatable independently of the screen while defining a tilt axis for said blade holder (4, 6) and hence said blade above the contact line and closely adjacent thereto to locate said rotatable support ring, said fulcrum pin, and said rocking lever entirely above said contact line (8) and hence above said back up support (15).

3,960,077

PRINTING WITH BLANKET HAVING RECESSED PORTION

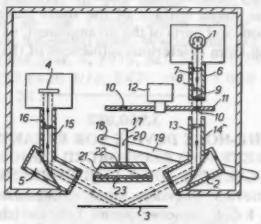
Frank Henry Aylett, Otley, England, assignor to Vickers Limited, London, England

Filed Nov. 26, 1974, Ser. No. 527,484

Claims priority, application United Kingdom, Nov. 29, 1973, 55519/73

Int. Cl.² B41F 9/00

U.S. Cl. 101—142 **13 Claims**



1. A method of determining the amount of water present on the surface of a printing plate carried by a plate cylinder during offset lithographic printing, which method comprises:

a. applying water to the non-printing area of the printing plate,

b. applying ink to the printing area of the printing plate,

c. transferring ink from the printing area to an offset blanket which is carried by a blanket cylinder and which includes a recessed portion in its surface, said recessed portion being arranged to be in registry with a part of the non-printing area of the printing plate when at the nip between the plate cylinder and the blanket cylinder,

d. transferring ink from the blanket to a receiving member to be printed, and

e. determining the amount of water present on a monitoring zone constituted by said part of the non-printing area.

3,960,078

PRINTING PROCESSES

Harold Frederick Farrow, Hitchin, and Bernard Booth Rackstraw, High Wycombe, both of England, assignors to Encoline(Process)Limited, Slough, England

Filed Feb. 10, 1975, Ser. No. 548,176

Int. Cl.² B41N 1/06; B41F 1/00

U.S. Cl. 101—150 **7 Claims**

1. Intaglio printing apparatus for use in applying deposits of a viscous fluid on a nonporous substrate comprising an intaglio printing plate provided with at least one air-bleed passage communicating with an image engraved in the plate and provided with vent means for allowing air trapped in the engraved cavity of the image between the substrate and the plate to escape in response to increase in pressure by injection of said fluid into said cavity, together with any excess fluid injected into the cavity, so that the latter is not added to the deposit on withdrawal of the plate, said vent means comprising a nonreturn valve having surfaces acting to block flow of air and any excess fluid back into said cavity in response to reduction in the pressure in said cavity and enabling flow of air and any

excess fluid therepast during injection of said fluid into said cavity.

3,960,079

ROTARY PRINTING PRESS

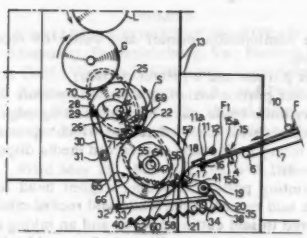
Federico Capetti, Turin, Italy, assignor to Societa' Nebiolo S.p.A., Turin, Italy

Filed July 15, 1974, Ser. No. 488,858

Claims priority, application Italy, July 25, 1973, 69231/73

Int. Cl.² B65H 5/10, 5/12

U.S. Cl. 101—232 **4 Claims**



1. A rotary printing press for single sheets of the type comprising a rotary printing cylinder, means for driving the printing cylinder at a constant velocity, a feeder table onto which the sheets are fed partly overlapping, means on the feeder table for setting the sheets in register frontally and laterally, a rotary transfer drum having a diameter larger than the diameter of said cylinder, means driving the transfer drum at an angular velocity which varies periodically with a period equal to the time taken by the printing cylinder to make one complete revolution, oscillating transfer means having gripping means for transferring the sheets from the feeder table to the transfer drum and means for transferring the sheets from the transfer drum to said printing cylinder, wherein the improvement comprises elliptical gear means operatively disposed intermediate said printing cylinder and said transfer drum, said elliptical gear means being sized to impart to the transfer drum a peripheral velocity which varies from a minimum value substantially equal to the constant peripheral velocity of the printing cylinder to a maximum velocity which is higher than said minimum value and higher than the peripheral velocity of the printing cylinder, cam means mounted on the axis of said printing cylinder for driving said oscillating transfer means, said cam means being rotationally oriented relative to the printing cylinder such that the transfer means is moved from a stop position adjacent said feeder table, at which time said gripper means picks up a sheet from said feeder table, to

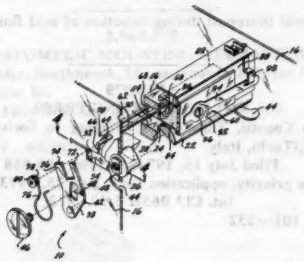
a velocity greater than the peripheral velocity of said printing cylinder adjacent to said transfer drum prior to the transfer drum reaching its maximum velocity and additional gripping means on said transfer drum for receiving a sheet from said oscillating transfer means when the velocities of said transfer drum and said oscillating transfer means are equal and means to render said means for transferring the sheets from said transfer drum to said printing cylinder operative when the peripheral velocity of said transfer drum is equal to the peripheral velocity of said printing cylinder.

3,960,080

COMBINATION ROTARY PAPER CUTTER AND LOGO PRINTER

Carmeli Adahan, Berkeley, Calif., assignor to The Singer Company, New York, N.Y.

Filed Feb. 12, 1975, Ser. No. 549,258
Int. Cl.² B41F *3/82, 13/60*
U.S. Cl. 101—291 **4 Claims**



3. The combination printer and cutter of record media comprising:

a cutter portion and a printer portion,

said cutter portion including a stationary knife blade and a rotary knife blade, each having a cutting edge which are engagable with each other and which upon rotation of said rotary knife blade cuts record media disposed therebetween,

said printing portion including a print head for printing upon said record media while said record media is being severed in said cutting portion and an inking means,

said print head being oscillatable from said inking means into engagement with record media disposed in contacting relationship on said stationary knife blade of said cutting portion for printing on said record media disposed in said cutting portion, and

actuating means for oscillating said printing head and rotating said rotary knife concurrently about parallel axes.

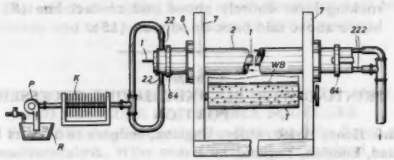
3,960,081

DRYING ARRANGEMENT FOR DRYING INKS, ADHESIVES AND ANALOGOUS SUBSTANCES ON SHEET MATERIAL

Helmut Gustavs, Steinhagen, and Ernst Dudziak, Gutersloh, both of Germany, assignors to Mohndruck Reinhard Mohn OHG, Gutersloh, Germany

Filed May 10, 1974, Ser. No. 468,115
Claims priority, application Germany, May 11, 1973, 2323792; Feb. 19, 1974, 2407823
Int. Cl.² B41F *23/00*
U.S. Cl. 101—416 A **38 Claims**

1. In an arrangement for drying inks, adhesives and analogous substances which polymerize when irradiated by UV radiation, particularly for use in printing machines in which as least one of the substances is applied to at least one major surface of a sheet material, a combination comprising guide means for guiding the sheet material in a path; drying means including a radiation source spaced from said path and adapted to emit UV radiation accompanied by incidental IR radiation at least toward the one major surface of the sheet material; and means for allowing UV radiation to reach the sheet material and for prohibiting the IR radiation from reaching the sheet material, said means comprising cooling means including a passage containing a cooling medium and located between said radiation source and at least the one major surface of the sheet material, said cooling means being permeable to the UV radiation but substantially impermeable to the IR radiation whereby the UV radiation passes through said cooling means and polymerizes the substance on the one major surface of the sheet material and the IR radiation is intercepted by said cooling means to prevent impingement upon the one major surface of the sheet material, the substance thereon, and parts of the arrangement, so that the same are protected from deleterious influences of the incidental IR radiation.

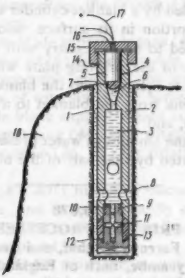


3,960,082

DOWN-THE-HOLE DEVICE FOR BREAKING ROCK, CONCRETE AND REINFORCED CONCRETE BY PULSEWISE HIGH LIQUID PRESSURE

Fedor Ignatievich Sloevsky, ulitsa Cheremushkinskaya, 32 korpus 2, kv. 4, Moscow; Naum Yakovlevich Orlov, ulitsa Klochkovskaya, 276-a, kv. 9, Kharkov; Petr Dmitrievich Gavrish, ulitsa 8 Siezda Sovetov, 7, kv. 38, Kharkov, and Anatoly Nikolaevich Rashevsky, ulitsa 23 Avgusta, 20, kv. 26, Kharkov, all of U.S.S.R.

Filed Jan. 29, 1974, Ser. No. 437,666
Int. Cl.² F42B *3/06*
U.S. Cl. 102—22 **3 Claims**



1. A down-the-hole device for breaking materials such as rock, concrete and reinforced concrete by pulsewise high liquid pressure, adapted to be lowered into a hole pre-drilled in the materials to be broken and pre-filled with a liquid, the device comprising: a hollow housing having a closed bottom; a closed chamber within the upper portion of said housing, to accommodate an explosive charge; a cavity defined within said housing below said chamber, communicating via lateral apertures made through the wall of said housing with the hole so that part of the liquid in the latter fills up said cavity when the device has been lowered into the hole; means for initiating the exposion of the charge; a partition made of an elastomeric material and sealingly positioned in said housing between said

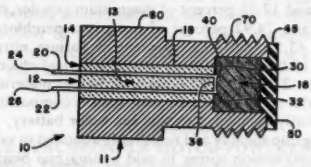
chamber and said cavity, first, to separate them prior to the explosion of the charge and, second, to establish communication therebetween after the explosion, resulting in destruction of said partition for gases produced by the explosion, to create a high-pressure pulse in the liquid in said cavity and for the liquid to act through said apertures upon the walls of the hole so as to break the materials; small-diameter passage means provided in the lower portion of said housing with openings therein, and having one end thereof communicating with said cavity and the other end thereof open on the external lateral surface of said housing; and a ring also made of an elastomeric material, received and secured about said lower housing portion below said apertures so that said ring closes off said openings of the passage means in said external laterial surface of the housing; said ring being expanded during the explosion of the charge by the high-pressure pulse and pressed thereby against the walls of the hole, below the destruction region, to sealingly close the hole and to retain the device therein.

3,960,083

IGNITER CONTAINING TITANIUM HYDRIDE AND POTASSIUM PERCHLORATE

Russel W. Dietzel, and William B. Leslie, both of Albuquerque, N. Mex., assignors to The United States of America as represented by the United States Energy Research & Development Administration, Washington, D.C.

Filed Mar. 6, 1975, Ser. No. 555,754
Int. Cl.² F42B *3/18*; F42C *19/12*; C06B *29/02*
U.S. Cl. 102—28 R **5 Claims**



1. An explosive device thermally safe against initiation at temperatures up to about 520°C. comprising a housing having a cavity therein, a pair of electrical conductors extending from the exterior of said housing into said cavity, a bridgewire in said cavity electrically connected with said conductors, an explosive charge in said cavity in close contact with said bridgewire consisting essentially of a mixture of from about 26 weight percent to about 33 weight percent titanium hydride particles blended with from about 74 weight percent to about 67 weight percent potassium perchlorate particles, said titanium hydride particles and potassium perchlorate particles being of size not greater than about 3 microns, with said explosive charge being directly ignitible by said bridgewire.

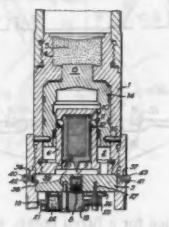
3,960,084

FUSE FOR RIFLE-GRENADE

Rene M. Chavee, Genk, Belgium, assignor to Fabrique Nationale Herstal S.A. en abrege FN, Liege, Belgium

Filed June 4, 1974, Ser. No. 476,194
Claims priority, application Belgium, Aug. 8, 1973, 803328
Int. Cl.² F42C *15/02*
U.S. Cl. 102—65.2 **3 Claims**

1. A fuse for a rifle grenade including:
a body (1) having an axial bore (2), said body being closed at one end of a holder (3) for a detonator (8) and terminating at its other end in a housing for a propellent charge (5), said detonator and said propellent charge forming part of a pyrotechnic chain;
a sleeve (6) mounted in said bore (2) and housing;
locking members (11) for locking said firing pin in its inactive position;
a control member (15) for said locking members (11), said control member being constituted by a slidable bolt part of which surrounds said sleeve and one end of which terminates in said housing, said slidable bolt being movable from an active position wherein it locks said locking members to an inactive position wherein it liberates said locking members;



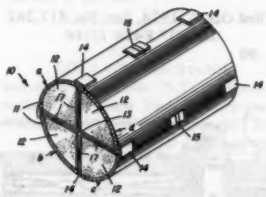
shearable pins (16) securing said bolt (15) to said body (1);
at least one passage (39) traversing said body and communicating with said axial bore;
and at least one plug (40, 41) mounted in the outer wall of the fuse and closing said passage, said plug being visible from the outside of the fuse and being expelled upon combustion of said detonator thus indicating this combustion.

3,960,085

VARIABLE GEOMETRY WARHEAD

David D. Abernathy, Fredericksburg, Va.; Herbert D. Adams, Ventura, Calif.; Warren L. Gilbertson, Fredericksburg, Va.; Isaac E. Leonard, III, Margate, N.J., and Denis A. Silvia, King George, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 25, 1967, Ser. No. 643,298
Int. Cl.² F42B *13/48*
U.S. Cl. 102—67 **10 Claims**



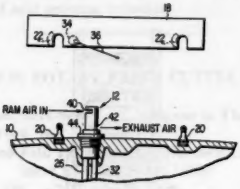
1. A warhead device comprising in combination
a plurality of initially closed interconnected equal segments forming a uniform geometric body;
booster means;
initiator means;
each of said segments comprising a kill mechanism means and a high explosive charge means in contact therewith; and
charge opening means disposed between said segments, whereby a firing of said charge opening means will separate a pair of said segments and expose said kill mechanism to the target at which time said initiator means is actuated for firing said detonator means for detonating said high explosive means and projecting said kill mechanism to the target.

3,960,086

AIR VALVE SAFETY DEVICE FOR BOMB FUZES

Evan D. Fisher, Chevy Chase, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 28, 1975, Ser. No. 554,339
Int. Cl.² F42C *5/00, 15/12*
U.S. Cl. 102—70.2 G **8 Claims**



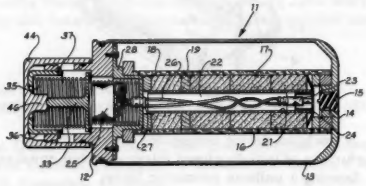
1. A safety device for a fuzed bomb, which comprises:
a fuzed bomb having a receptacle positioned along the longitudinal surface thereof, a nose plug covering the frontal portion thereof, and means located adjacent said receptacle for suspending said bomb from a bomb rack when in its stowed position;
an air-actuated fuzing device positioned within said frontal portion of said bomb behind said nose plug and including means for generating electrical energy in response to said slipstream air received from said air valve means;
air valve means positioned within said receptacle for admitting slipstream air to said fuzing device only after said bomb is released from said stowed position and has separated a predetermined minimum distance from said bomb rack; and conduit means connected between said air-valve means and said fuzing device for conducting said slipstream air towards said fuzing device and for conducting exhaust air towards said air-valve means.

3,960,087

SMOKE AND ILLUMINATION SIGNAL

Bobby D. Beatty, Bloomfield; Russell D. Daniel, Bloomington; Billy J. Humerickhouse, Odon, and Gary G. Norris, Burns City, all of Ind., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 4, 1974, Ser. No. 512,262
Int. Cl.² F42B *13/44*
U.S. Cl. 102—90 **8 Claims**



1. A smoke and illumination signal adapted to be launched in a body of sea water beneath the surface thereof comprising,
a base having a cavity therein,
a sea water battery positioned within said cavity,
a disc closing an opened end of said cavity,
a shell attached to one end of said base containing a smoke composition and a flare composition separated by a quantity of a starter composition, said smoke composition being comprised, by weight, of between 50 and 54 percent of yellow dye mix, between 19 and 25 percent of potassium chlorate, between 10 and 16 percent of refined sugar, between 2 and 8 percent of baking soda and between 5 and 11 percent of diatomaceous earth and said flare composition being comprised by weight of between 17 and 21 percent of magnesium powder, between 12 and 22 percent of potassium perchlorate, between 24 and 34 percent of barium nitrate, between 23 and 31 percent of sodium oxalate, between 3 and 5 percent of asphaltum and between 3¾ and 4¼ percent of binder material,
an electric squib adjacent said smoke composition and electrically connected to said sea water battery,
an arming cup slidably and removably attached to said base,
a first compression spring in said arming cup biasing said disc in a closing relationship with respect to said cavity, and
a second compression spring within said cavity biasing said disc in an opening relationship with respect to said cavity whereby, upon launching of said signal, said first compression spring ejects said arming cup and said second compression spring ejects said disc.

5. A smoke and illumination signal adapted to be launched in a body of sea water beneath the surface thereof comprising,
a base having a cavity therein,
a sea water battery positioned within said cavity,
a disc closing an opened end of said cavity,
a shell attached to one end of said base containing a smoke composition and a flare composition separated by a quantity of a starter composition, said smoke composition being comprised, by weight, of between 45 and 51 percent of green dye mix, between 22 and 28 percent of potassium chlorate, between 17 and 23 percent of refined sugar, between 2 and 4 percent of baking soda and between 3 and 5 percent of diatomaceous earth, and said flare composition being comprised, by weight, of between 13.28 and 17.28 percent of magnesium powder, between 18.92 and 24.92 percent of potassium perchlorate, between 43.55 and 49.55 percent of barium nitrate, between 10.00 and 16.00 percent of polyvinyl chloride and between 2.25 and 4.25 percent of binder material,
an electric squib adjacent said smoke composition and electrically connected to said sea water battery,
an arming cup slidably and removably attached to said base,
a first compression spring in said arming cup biasing said disc in a closing relationship with respect to said cavity, and
a second compression spring within said cavity biasing said disc in an opening relationship with respect to said cavity whereby, upon launching of said signal, said first compression spring ejects said arming cup and said second compression spring ejects said disc.

3,960,088

CASE BONDING COMPOSITE FOR DOUBLE BASE PROPELLANTS

Willis L. Greever, LaVale, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 26, 1970, Ser. No. 18,024
Int. Cl.² F42B *1/00*
U.S. Cl. 102—103 **6 Claims**

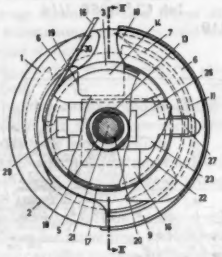
1. A two layer case bonding composite for double base propellants comprising:
1. a first layer comprising neoprene, phenyl β-naphthalamine, zinc oxide, a neoprene stabilizer, an oil soluble phenolic resin and triphenylmethane triisocyanate, and
2. a second layer, bonded to said first layer, comprising polyvinyl formal and a curing agent selected from the group consisting of titanium acetylacetonate and 2,4-tolylene diisocyanate
wherein both layers are in the cured state.

3,960,089

DEVICE FOR UNWINDING THREAD AND BOBBIN USED THEREWITH

Pieter Joseph Bogaert, Sint-Niklaas, Belgium, assignor to Manta, Waasmunster, Belgium

Filed Sept. 6, 1974, Ser. No. 503,572
Claims priority, application Belgium, Sept. 7, 1973, 804596
Int. Cl.² D05B 57/14; B65H 49/18
U.S. Cl. 112—228 4 Claims



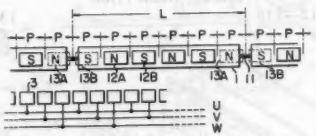
1. A device for unwinding thread comprisng a bobbin having a sleeve about which the thread is wound and a pin having a circular cross-section upon which the bobbin is rotatably mounted so that withdrawal of the thread will cause rotation of said bobbin around said pin, said sleeve having an internal cross-section of polygonal-shape which polygon is circumscribed about a circle the diameter of which is 4–15 percent greater than the diameter of said pin.

3,960,090

LINEAR SYNCHRONOUS MOTOR POWERED VEHICLE

Naoki Maki, Ibaraki, and Katsunori Suzuki, Takahagi, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Aug. 2, 1974, Ser. No. 494,289
Claims priority, application Japan, Aug. 15, 1973, 48-90892
Int. Cl.² B61B 13/08
U.S. Cl. 104—148 LM 17 Claims



1. A linear synchronous motor powering system for vehicles comprising:

a magnetic means for developing a traveling magnetic field, said magnetic means being provided along a track;

a supporting means for supporting a vehicle body on the track, said supporting means being provided at each vehicle body;

a plurality of field poles corresponding to said magnetic means, said field poles being disposed with a predetermined pole pitch along the length of the vehicle body; and

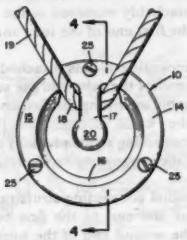
at least one interval along the length of the vehicle body formed in the alignment of said plurality of field poles along the vehicle body, each said interval containing no field poles and being equal to an integer multiple of said pole pitch.

3,960,091

ROPE HOOK MOUNT FOR A VEHICLE OR THE LIKE

Delbert D. Ehlert, P.O. Box 762, Grass Valley, Calif. 95945

Continuation of Ser. No. 257,160, May 26, 1972, abandoned.
This application Nov. 1, 1974, Ser. No. 519,927
Int. Cl.² B60P 7/08; B61D 45/00
U.S. Cl. 105—475 1 Claim



1. A rope hook mount for attachment to a generally vertical portion of the body of a vehicle or the like comprising: a unitary device of rigid material, said device being circular and generally planar with opposed major faces and a given maximum cross-sectional diameter, one of said major faces conforming to the contour of said portion of the body of the vehicle or the like to which said device is to be attached and the other of said major faces forming part of a given smoothly convex surface having a radius of curvature at least about equal to said given cross-sectional diameter, said device having a generally circular aperture of continuously increasing diameter extending from adjacent said one major surface toward said other major surface normally thereto, said aperture being interrupted adjacent said other major surface to leave intact a portion of said other major surface extending radially from about the center of said aperture to the periphery of said aperture providing an elongated integral lip member having said radius of curvature spaced from said one major surface of said device whereby a rope may be hooked about said lip member with no portion of said other major surface including said lip member projecting beyond said given smoothly curved convex surface, and

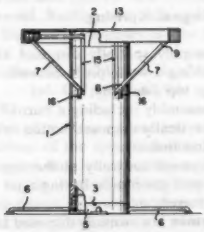
means for attaching said device to said portion of the body of the vehicle or the like.

3,960,092

COLLAPSIBLE STOOL

Nikola Levkovski, Forest Hills, N.Y., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Feb. 19, 1975, Ser. No. 551,035
Int. Cl.² A47B 3/00
U.S. Cl. 108—41 5 Claims



1. A collapsible stool comprising:

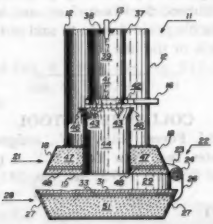
a. a tube having a first end and a second end;
b. a first cap detachably mounted to the first end of the tube;
c. a second cap detachably mounted to the second end of the tube;
d. a plurality of leg supports radially and detachably mounted to the second cap;
e. A plurality of support struts having first ends extending radially from the tube and extending above the first end of the tube, detachably mounted at the first ends to the tube between the first end of the tube and the second end of the tube;
f. a plurality of mounting means attached to the tube between the first end of the tube and the second end of the tube for detachably mounting the first ends of the support struts to the tube;
g. a plurality of connecting struts pivotally connected to the second ends of the support struts wherein a plane surface is formed; and
h. a plurality of radial connecting struts radially and pivotally mounted at one end to the first cap and pivotally connected at the second end of the support struts;
i. a seating surface attached to the plurality of connecting struts;
wherein the tube has an inside diameter and a length of sufficient size to enclose the plurality of leg supports, support struts, connecting struts and radial connecting struts and when the first cap is unmounted from the first end the support struts, connecting struts and radial connecting struts pivot below the first cap so that when the first cap is remounted on the first end, the support struts, connecting struts and radial connecting struts can be inserted in the tube.

3,960,093

PORTABLE FORGE

Donald R. Gregory, 669 S. Nardo T-4, Solana Beach, Calif. 92075

Continuation-in-part of Ser. No. 451,753, March 18, 1974, abandoned. This application Dec. 23, 1974, Ser. No. 535,183
Int. Cl.² F23D *13/26*
U.S. Cl. 110—3.5 **8 Claims**



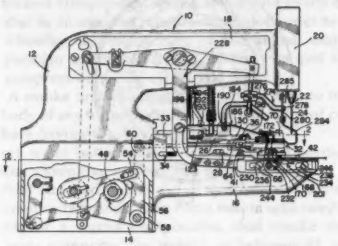
1. A portable forge comprising:
a forge base;
a forge top assembly spatially disposed above said forge base for receiving a work piece between said forge base and said forge top assembly;
said forge top assembly including a burner shield;
a burner tube vertically disposed within said burner shield in a top portion thereof;
a gas nipple disposed centrally at the top portion of said burner tube, said gas nipple having a jet orifice pointing downwardly therefrom;
an oxidizer ring tube horizontally disposed in proximity with said burner tube and having a plurality of oxidizer orifices therein pointed downwardly and towards the axis of said oxidizer ring tube;
an oxidizer nipple coupled to said oxidizer ring tube;
a mixing chamber disposed beneath said burner tube;
a slab surrounding at least the bottom of said mixing chamber and terminating in the bottom surface of said forge top assembly.

3,960,094

AUTOMATIC BUTTON POSITIONING APPARATUS

James C. Hsiao, Chicago, Ill., assignor to Union Special Corporation, Chicago, Ill.

Filed Nov. 6, 1974, Ser. No. 521,432
Int. Cl.² D05B *3/14*
U.S. Cl. 112—110 **15 Claims**



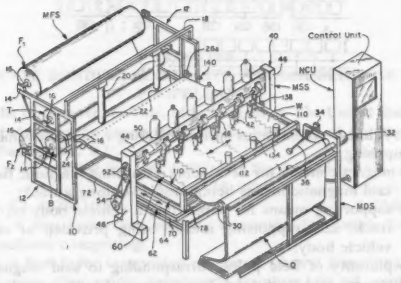
1. Apparatus for delivering buttons to and removing them from the sewing station of a button sewing machine comprising:
button conveyor means;
button loader means including a chute means for feeding buttons to said conveyor means;
button securing recess means located in said conveyor means for accepting buttons from said loader means;
indexing means moving said conveyor means through a series of predetermined steps;
orientating means operative to position a button for sewing; and
means operative to forceably remove a button from said recess means subsequent to its attachment to a fabric.

3,960,095

AUTOMATIC QUILTING MACHINE

Wayne G. Story, 7 Hickory Lane, Algonquin, Ill. 60102

Filed Mar. 14, 1975, Ser. No. 558,341
Int. Cl.² D05B *11/00*
U.S. Cl. 112—118 **13 Claims**



1. In an automatic quilting machine arrangement for continuously forming units of quilted fabric, such as bedspreads or the like, by sewing together a plurality of layers of different material from roll stock with a predetermined pattern design of stitching, the combination of:

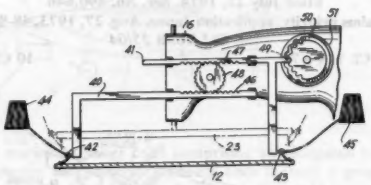
a. a frame including:
  i. a material feed station;
  ii. a material sewing station;
  iii. a fabric discharge station;
b. material supporting means on said frame at said feed station for supporting a plurality of rolls of material to be quilted;
c. material feed means on said frame at said feed station for withdrawing from said rolls a predetermined length of material stock sufficient for forming one unit of quilted fabric and also for maintaining tension on said material rearwardly of said sewing station;
d. slack take-up means on said frame at said discharge station for maintaining tension on said material forwardly of said sewing station;
e. at least one sewing mechanism on said frame at said sewing station;
f. a material holding carriage mounted for universal movement on said frame at said sewing station adjacent said sewing mechanism and including:
  i. a lower carriage section mounted on said frame for movement longitudinally thereof between said feed and discharge stations;
  ii. an upper carriage section mounted on said lower carriage section for movement transversely thereof;
  iii. said upper carriage section including means for clamping under tension a section of said material to be quilted;
g. separate motor drive means for moving each of said carriage sections relative to each other and to said frame;
h. control means for operating said motor drive means whereby the lower and upper sections of said carriage are moved longitudinally and transversely of the frame, respectively, so that said sewing mechanism will form a predetermined pattern of stitching.

3,960,096

APPARATUS AND METHOD FOR THE MANUFACTURE OF FACE MASKS

James W. Zobel, P.O. Box 125, Mount Kisco, N.Y. 10549

Filed Dec. 30, 1974, Ser. No. 537,262
Int. Cl.² D05B 19/00
U.S. Cl. 112—121.11 **14 Claims**



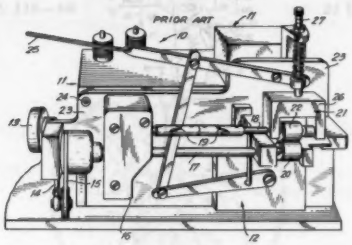
1. Apparatus for producing face masks from a roll of porous material, said apparatus comprising means for rotatably supporting the roll of material to permit unwinding thereof, driven roller means for pulling the material to unwind the material from the roll in taut condition, a sewing machine for sewing a longitudinal line of stitches along each of the opposite side edges of the material while the material is taut, means for periodically interweaving a cord along each side edge with the line of stitches to form alternate interwoven cord portions and intervening free loops of said cord, and cutter means for cutting the material transversely thereof at successive spaced locations at which the cord is interwoven with the line of stitches whereby to separate successive sections of porous material, with said loops of cord attached thereto, constituting face masks.

3,960,097

HIGH SPEED GEARLESS FABRIC PULLER

Charles Block, North Bellmore, N.Y., assignor to Joseph Galkin Corporation, Hicksville, N.Y.

Continuation-in-part of Ser. No. 346,070, March 29, 1973, Pat. No. 3,886,878. This application June 3, 1974, Ser. No. 475,810
Int. Cl.² D05B 27/10
U.S. Cl. 112—214 **15 Claims**



1. A puller attachment for use with fabric handling apparatus such as a sewing machine, or the like, comprising: roller means for receiving fabric sewn and discharged by the operation of said sewing machine and urging said fabric in a forward direction, said roller means including upper and lower cooperative rollers supported by upper and lower drive output shafts, respectively; drive means interconnecting a drive mechanism of said sewing machine and said upper and lower rollers, said drive means synchronously responsive to the operation of said sewing machine for causing substantially synchronous identical angular displacement of said upper and lower rollers substantially only during periods of sewing machine operation, said drive means including a linkage assembly disposed adjacent and cooperatively interconnected with said roller means, said drive means imparting one-way rotary movement to each of said upper and lower rollers during said periods of sewing machine operation, and clutch means interconnecting said linkage assembly and each of said upper and lower drive output shafts for permitting the angular displacement of each of said upper and lower rollers in one direction only during operation of said puller attachment, said clutch means including an upper clutch mounted upon said upper drive output shaft and a lower clutch mounted upon said lower drive output shaft; and lift means cooperatively connected to said upper drive output shaft for separating said upper and lower rollers from one another.

3,960,098

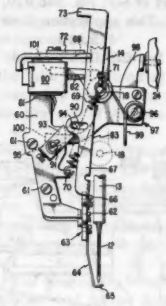
THREAD WIPER AND TENSION RELEASE MECHANISM FOR SECURING MACHINES

Reinhold Papajewski, Buchig, and Helmer Heinz Holl, Karlsruhe, both of Germany, assignors to The Singer Company, New York, N.Y.

Filed Dec. 18, 1974, Ser. No. 534,012
Int. Cl.² D05B 65/00
U.S. Cl. 112—252 **4 Claims**

1. A needle thread tension release and wiping mechanism for sewing machines of the type including a sewing needle, actuating mechanism for reciprocating said needle, needle thread severing means, a needle thread wiper, and a needle thread tensioning device including a tension releasing means, the improvement comprising a control member, drive means associated with said actuating mechanism for influencing displacement of said control member, linkage operatively connecting both said needle thread wiper and said tension

releasing means to said control member for actuation in response to said displacement of said control member, and a



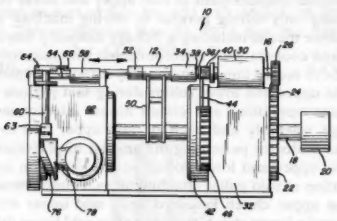
solenoid selectively effective to establish operative connection between said drive means and said control member.

3,960,099

CAN TRIMMING APPARATUS

Robert M. Dobias, San Jose; Tibor Kmetz, Santa Clara, and Walter C. Warnell, San Jose, all of Calif., assignors to National Can Corporation, Chicago, Ill.

Filed Jan. 20, 1975, Ser. No. 542,127
Int. Cl.² B21D 51/26
U.S. Cl. 113—7 R 4 Claims



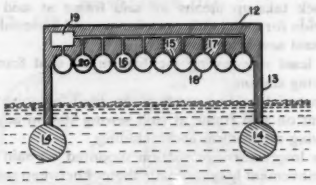
1. Apparatus for trimming a free edge portion off a container body comprising a frame; a mandrel rotated on said frame for receiving container bodies with cutting means associated with said mandrel for trimming a free edge from the container body; a driven tool shaft extending parallel to said mandrel with drive means between said tool shaft and mandrel to rotate said mandrel; and loading means for supplying container bodies to said mandrel, said loading means including supply means for positioning container bodies in axial alignment with said mandrel, a plunger axially aligned with said mandrel, guide means on said frame for guiding said plunger for movement axially towards and away from said mandrel, a loading shaft rotated about a fixed axis on said frame adjacent said guide means, an arm fixed to said loading shaft and extending radially therefrom, a link interconnecting said arm and said plunger, a continuously rotating member driven by said tool shaft and having a camming surface thereon, and a cam on said loading shaft in engagement with said camming surface for rotating said shaft a limited amount between angular extreme positions that are substantially less than 90° to oscillate said arm between positions and reciprocate said plunger towards and away from said mandrel.

3,960,100

PRESSURIZED SHIP STRUCTURE FOR SLAMMING LOADS

Richard B. Chapman, Reston, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 2, 1975, Ser. No. 583,083
Int. Cl.² B63B 1/10
U.S. Cl. 114—61 6 Claims



1. In a semisubmerged ship having a laterally extending platform supported above the water's surface by at least one water surface piercing strut member mounted on at least one elongate hull, an improvement therefor for reducing the effects of impacting waves is provided comprising:

means carried on the underside of the laterally extending platform for resiliently absorbing the slamming loads of impacting waves;

means carried on the underside of the laterally extending platform and upwardly of the resiliently absorbing means for pneumatically translating the slamming loads into tensile stresses; and

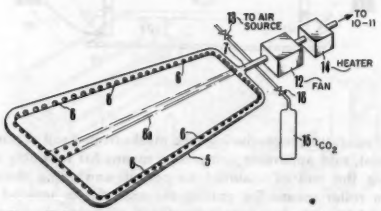
means coupled between the resiliently absorbing means and the pneumatically translating means for transmitting the tensile stresses to the platform.

3,960,101

SHIPS FOR TRANSPORTING IRON ORE PELLETS

Hideo Suzuki, Mito, Japan, assignor to Mitsui Shipbuilding & Engineering Co., Ltd., Tokyo, Japan

Filed July 22, 1974, Ser. No. 490,646
Claims priority, application Japan, Aug. 27, 1973, 48-96024
Int. Cl.² B63B 25/04
U.S. Cl. 114—73 10 Claims



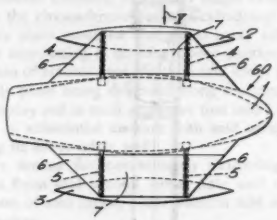
1. A ship for transporting iron ore pellets, and the like, said ship having holds for loading said pellets and a hardening system for drying and hardening the pellets loaded in the holds, said hardening system including a piping system formed from a network of perforated pipes arranged in said holds and means for connecting the exhaust gas pipe of the propulsion boiler and/or propulsion engine of said ship to said piping system for ejecting the exhaust gas through the perforations of the perforated pipes onto the pellets loaded in the holds.

3,960,102

TRIMARANS

Duncan Clement Davy, Spey House, Mayfield, East Sussex, England

Filed June 24, 1975, Ser. No. 589,848
Claims priority, application United Kingdom, July 8, 1974, 30123/74
Int. Cl.² B63B 43/14
U.S. Cl. 114—123 9 Claims



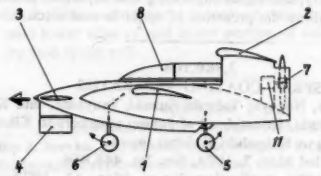
1. A trimaran having a central hull, a pair of floats, outriggers for supporting the floats on each side of the central hull, and inboard supports from which the floats can be suspended in an inboard position, the outriggers being pivotally mounted on the central hull, so that the floats can be moved bodily along the outriggers until they are supported from the inboard supports and then the outriggers can be pivoted so that they are positioned alongside the central hull.

3,960,103

MARINE SKIMMER CRAFT

Herbert Rey, Gretenrade 6, 2301 Schonkirchen, Germany

Filed Apr. 1, 1974, Ser. No. 456,667
Claims priority, application Germany, June 4, 1973, 2328293
Int. Cl.² B60F 3/00; B64C 35/00
U.S. Cl. 115—1 C 4 Claims



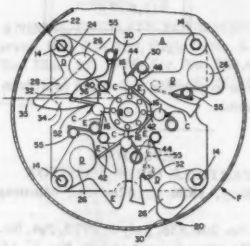
1. A marine skimmer craft comprising an elongated body with anterior and posterior opposite ends thereof; a propulsion means for driving the body, mounted on said posterior end; at least two sets of wings mounted on the elongated body, each set having a wing extending laterally opposite from a remaining wing of the set extending in an opposite direction from an opposite side of the body, the wings of each set having upper and lower substantially flat surfaces positioned in substantially horizontal planes relative to the elongated body in a substantially horizontal plane, one set being mounted on the elongated body at an upper portion of the posterior end, a remaining other set being mounted substantially intermediately between said anterior and posterior opposite ends, in a different lower plane relative to said upper portion; and forward pivotable control-surface elements, one element mounted on each of opposite sides of the elongated body at said anterior end, each extending laterally in opposite directions from one-another each in a substantially horizontal plane laterally; and each wing comprising a plurality of panels elongated from front to back with each of lateral edges extending between the front and the back and being adapted for mating with a lateral edge of another panel, at least two panels for each wing being in a mated state.

3,960,104

BACK-UP ALARM WITH IMPROVED KEEPER

David H. Van Tuyl, Palo Alto, Calif., assignor to E. D. Bullard Company, Sausalito, Calif.

Filed May 9, 1975, Ser. No. 576,134
Int. Cl.² B60Q 5/00
U.S. Cl. 116—60 21 Claims



1. In a vehicle alarm for providing an audible alarm signal upon vehicle wheel rotation in a predetermined or so-called "ringing" direction, the alarm characterized in that it includes means for mounting the alarm at the hub of the vehicle wheel for mutual rotation therewith about common rotational axes; a bell having an interior surface; at least one clapper eccentrically mounted for reciprocal swinging movement of its striking surface along a path extending between a bell striking position and a cocked position, the striking position characterized by engagement of the clapper striking surface against the bell interior surface, the cocked position characterized by location of the striking surface at its furthest point of travel along the path from the bell striking position; the alarm further preferably including means for resiliently retracting the clapper from engagement with the bell as soon as the clapper strikes the bell to mitigate dampening of the bell by the clapper; and, the alarm further including a keeper for holding the clapper away from its bell striking position during alarm rotation in the opposite or so-called "non-ringing" direction,

the improvement wherein the keeper maintains the clapper substantially immobile at its cocked position throughout repeated full revolutions of the alarm in the "non-ringing" direction.

3,960,105

SOUND MAKING SYSTEM

Thomas F. Ring, Indianapolis, Ind., assignor to P. R. Mallory & Co., Inc., Indianapolis, Ind.

Filed Feb. 14, 1975, Ser. No. 549,873
Int. Cl.² G04B 23/00; G10K 1/32
U.S. Cl. 116—22 R 12 Claims

1. A sound making system comprising

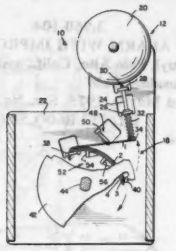
a. a noise making device,

b. a spring loaded striker intermittently striking said noise making device,

c. at least two spring members, mounted juxtaposition one another, a distal end of said members intermittently engaging said spring loaded striker, and

d. means selectively engaging said members for slowly bending said spring members to store energy therein substantially simultaneously and for releasing said energy substantially instantaneously and individually, a first

spring member striking said spring loaded striker and the next succeeding spring member striking said first spring



member so as to provide individual sounds in a predetermined sequence.

3,960,106

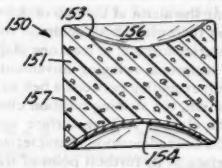
PARTICLE FLOW MONITOR

Robert J. De Brey, 1830 E. 42nd St., Minneapolis, Minn. 55407

Division of Ser. No. 268,538, July 3, 1972, Pat. No. 3,842,791, which is a continuation-in-part of Ser. No. 37,157, May 14, 1970, Pat. No. 3,674,316. This application Oct. 15, 1974, Ser. No. 514,644

Int. Cl.² G08B *3/02*

U.S. Cl. 116—67 R **32 Claims**



1. An apparatus for sensing particles moving with a flowing fluid comprising: a housing having an inside wall surrounding a chamber, an inlet opening open to the chamber, an outlet opening open to the chamber, and an open end opposite the inlet opening whereby fluid and particles can flow from the inlet opening through the chamber and out through the outlet opening, said inside wall of the housing generally increasing in size from the inlet opening toward the open end whereby the chamber increases in size from the inlet opening toward the open end, particle sensing means located across said open end of the chamber for producing audio signals related to the amount of particles which hit the sensing means during movement of particles through the chamber, said sensing means including a member comprising a foam body having a plurality of cells, and means adjacent the inside surface of the body for receiving the impaction forces of particles thereby producing audio signals, said body having a second surface spaced from the first surface exposed to the surrounding environment.

3,960,107

EXPANDABLE IRRIGATION SIGNAL

Edward W. McCloskey, 439-1/2 Riverside Drive, Burbank, Calif. 91506

Filed May 27, 1975, Ser. No. 580,662

Int. Cl.² G01F *23/08*

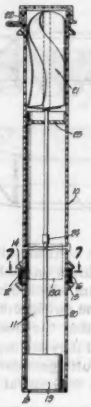
U.S. Cl. 116—118 A **6 Claims**

1. An irrigation signalling device comprising:

a. an elongated body providing a float chamber, said body being adapted to be installed in an irrigation ditch and having a lower portion which extends downwardly from the bottom of the ditch to form a well therebelow, and having an upwardly extending position which extends a distance above the upper boundary of the ditch;

b. an entrance opening means provided in said body which connects to the irrigation ditch and permits irrigation water to enter the float chamber of the body;

c. a float in said body positioned in the well formed in said elongated body, said float being adapted to be moved upwardly as said well fills with water;



d. a connection means connected to said float and extending upwardly within and to the upper end of said body; and

e. an expandable signal positioned within the upper end of said body and connected to said connection means, said signal being moved vertically upwardly by said connection means when water enters said well in order to vertically project said signal to a position above the upper end of said body, said signal expanding into expanded position thus signalling the presence of water in said ditch.

3,960,108

SPRAY COATING APPARATUS

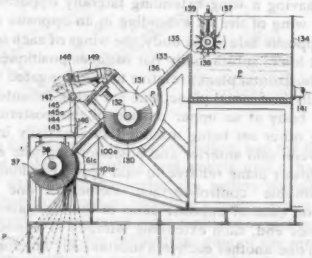
Minoru Ichigo, Nagoya; Takeshi Suzuki, Inuyama, and Katsumasa Harada, Komaki, all of Japan, assignors to Kikusui Kagaku Kogyo Kabushiki Kaisha, Japan

Filed Mar. 7, 1974, Ser. No. 448,866

Claims priority, application Japan, Mar. 12, 1973, 48-28800; July 5, 1973, 48-76419; Sept. 14, 1973, 48-104239; Oct. 11, 1973, 48-114163

Int. Cl.² B05C *5/00*

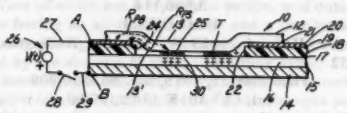
U.S. Cl. 118—324 **8 Claims**



1. A spray coating apparatus comprising, in combination:

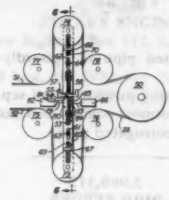
a supporting frame;
a first vessel fixedly mounted on said supporting frame, said vessel containing a coating agent in the form of a bulk liquid;
a second vessel also fixedly mounted on said supporting frame;
means for continuously supplying the coating agent from said frist to said second vessel at a prescribed rate;
a spray roll rotatably mounted over said supporting frame, said spray roll comprising a cylindrical core and a number of resilient elements of slender shape extending radially from the circumference of said cylindrical core;
a supply plate mounted along said spray roll, said supply plate comprising a slanting upper portion and a lower portion of arcuate cross section, said lower portion of said supply plate being disposed along the circumference of said spray roll in such a manner that said lower portion is held in substantial contact with said spray roll at least along its lower edge; and
delivery means for continuously delivering the coating agent from said second vessel onto said slanting upper portion of said supply plate wherein said delivery means comprises:
a slanting delivery plate onto which the coating agent is continuously supplied by overflow from said first vessel;
a receptacle of substantially arcuate cross section generally extending parallel to the axis of said spray roll and having one edge joined to the lower edge of said delivery plate and the opposite edge joined to the upper edge of said upper portion of said supply plate; and
a delivery roll rotatably mounted in said receptacle so as to extend parallel to the axis of said spray roll, said delivery roll also comprising a cylindrical core and a number of resilient elements of slender shape extending radially from the circumference of said cylindrical core;
whereby upon rotation of said delivery roll in a predetermined direction, the coating agent which has been delivered into said receptacle from said delivery plate is fed out onto said upper portion of said supply plate in the form of a layer of unvarying thickness;
whereby the coating agent is sprayed onto work away from said lower edge of said lower portion of said supply plate by said spray roll.

3,960,109
ELECTROSTATIC TONER TRANSFER
Phillip J. Stevko, Jr., Euclid, Ohio, assignor to Addressograph Multigraph Corporation, Cleveland, Ohio
Division of Ser. No. 457,071, April 1, 1974, Pat. No. 3,917,881. This application May 9, 1975, Ser. No. 576,124
Int. Cl.² B05B 5/02
U.S. Cl. 118—637 **9 Claims**



1. A device for transferring a pattern of electrostatically charged developer particles, bound in an image pattern to an image surface of an insulating member by an electric field, to a transfer surface of a transfer member, said device comprising:
a conductive base interfacing with a non-image surface of the insulating member;
a dielectric member adapted to interface on one side thereof with the image surface of the insulating member;
a conductive layer disposed on the opposite side of said dielectric member and adapted to interface with a portion of the transfer surface of the transfer member;
said dielectric member and associated conductive layer each having an aperture in general alignment with the image pattern of developer particles on the insulating surface prior to transfer;
means for bringing the transfer surface into engagement with said conductive layer; and
means for causing reversal of the direction of the net electric field acting on the developer particles to effect an electrostatic bond between the developer particles and the transfer surface.

3,960,110
ANIMAL FACILITY EQUIPMENT
Frank R. Laurenz, P.O. Box 359, Eagle Butte, S. Dak. 57625
Filed Mar. 21, 1975, Ser. No. 560,601
Int. Cl.² A01K 1/00; B65G 25/08
U.S. Cl. 119—28 **28 Claims**



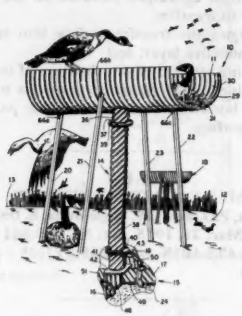
15. In an animal facility comprising a movable assembly and power train means for effecting automatic movement of said assembly along a direction of travel, the improvement characterized by the feature that said facility additionally includes means for emergency reversal of the direction of travel of said assembly, said emergency reversal means comprising
i. a stress balance means in said power train means, said stress balance means comprising an action member and means for biaing the same in a substantially balanced condition during normal movement of said assembly, said action member being responsively shifted into an increasingly unbalanced condition commensurate with any interference with said normal movement,
ii. primary sensing means for detecting a predetermined unbalanced condition for said action member, and
iii. actuating means responsive to said primary sensing means for actuating a reversal of the direction of travel of said assembly.

3,960,111
NESTING SUPPORT APPARATUS FOR FOWL
Barron M. Harris, Sr., Holiday, Fla., and Doyle F. Johnson, Lawrenceville, Ga., assignors to North American Culvert Corporation, Clearwater, Fla.
Filed May 22, 1975, Ser. No. 579,812
Int. Cl.² A01K 31/14
U.S. Cl. 119—23 **8 Claims**

1. Apparatus providing a nesting support for waterfowl or the like, comprising:
nesting means defining an open upwardly facing receptacle to receive and support the nest of a waterfowl or the like;
drain means in communication with said receptacle to allow precipitation to flow by gravity from said nesting means;
at least one upright support means having an upper end attached to said nesting means and extending downwardly a predetermined distance therefrom to terminate at a lower end;
base means attached to said lower end of said support means and providing a downwardly directed surface support of area sufficient to rest on a surface while selfs-

upportively maintaining said support means and said attached nesting means in upstanding relation to said base means;

said nesting means comprising a length of hemicylindrical corrugated pipe attached to said support means to main-



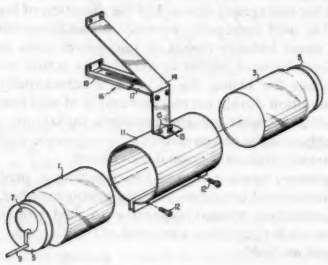
tain the corrugated pipe in upwardly-facing concave position; and

said drain means being provided by a separate drain hole formed at the lowermost point in each corrugation of said upwardly-facing corrugated pipe.

3,960,112
BIRD FEEDER

Boyce C. Tiller, Blackbeard Harbor, Coles Point, Va. 22442

Filed Sept. 16, 1974, Ser. No. 506,018
Int. Cl.² A01K *5/00*
U.S. Cl. 119—51 R **2 Claims**



1. A bird feeder of the type in which at least one bird feed container is mounted to a first support and said first support is suspended by a vertical hanging means from a second support, said bird feeder being constructed such that:

said first support is freely aerially suspended by said hanging means away from surrounding objects and away from said second support, so that undesirable animals are inhibited from reaching said first support and said bird feed container;

said bird feed container being a substantially closed container having an opening through which birds are able to feed;

said first support being a cylinder adapted for at least partially enclosing said container, said cylinder being formed from a substantially rectangular sheet of flexible material and fasteners, opposite sides of said sheet being connected by said fasteners to shape said sheet into said cylinder so that said container is insertable in either end of said cylinder;

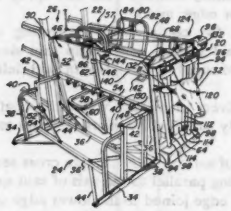
said fasteners being operative to draw opposite sides of said sheet closer to each other to reduce the diameter of said cylinder and thereby clamp said container into said cylinder, thereby permitting the use of various sized containers;

said bird feeder further comprising a stop member, said stop member protruding inside of said cylinder at substantially the longitudinal center thereof, thereby serving as a locating means for two of said containers inserted into either end of said cylinder.

3,960,113
ANIMAL RESTRAINT

Frank Kratky, Bellvue, Colo., assignor to Westguard Products, Inc., Fort Collins, Colo.

Filed Mar. 17, 1975, Ser. No. 558,668
Int. Cl.² A01K *1/06*
U.S. Cl. 119—99 **10 Claims**



1. An animal restraint comprising:

a pair of generally-upright elongated pipes spaced apart somewhat greater than the width of an animal to be restrained;

means for mounting said pipes to permit rotation of each pipe about its longitudinal axis;

a first spur gear mounted on one of said pipes near one end thereof;

a second spur gear mounted on the other of said pipes near one end thereof, with both of said gears being sized and aligned to intermesh so that each of said pipes is slaved to the other in rotation;

a pair of elongated tubes;

means for securing one of said tubes to one of said pipes in generally-parallel spaced relationship;

means for coupling the other of said tubes to the other of said pipes in generally-parallel spaced relationship and with the upper end portion of said other tube being movable toward and away from said other pipe;

means for urging said upper end away from said other pipe;

and means for releasably latching the assemblies of the other ends of said pipes and the adjacent ends of said tubes in a closed condition in which said tubes are positioned between said pipes.

3,960,114
HOG OILER

William P. Hovorak, 1023 W. 16th St., Wellington, Kans. 67152

Filed May 27, 1975, Ser. No. 580,908
Int. Cl.² A01K *13/00, 29/00*
U.S. Cl. 119—157 **10 Claims**

3. A livestock treater comprising:

a. a frame having an upright member mounted on a base;

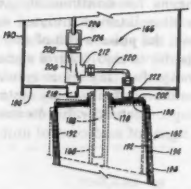
b. a reservoir mounted on an upper portion of said frame;

c. rubbing means for providing a rubbing surface for the livestock and dispensing fluid therefrom, said rubbing means having a drum mounted on an upper portion of said upright member by tiltable mounting means, said tiltable mounting means having a flange rigidly secured to the upper end portion of said upright member and extending outwardly therefrom and a ring rigidly secured

inside an upper end portion of said drum, said ring resting on top of said flange, said ring having the inner portion thereof substantially spaced from said upright member;

d. guide means attached to said rubbing means, said guide means supporting said rubbing means in an upright position;

e. conduit means communicably connecting said reservoir and said rubbing means;



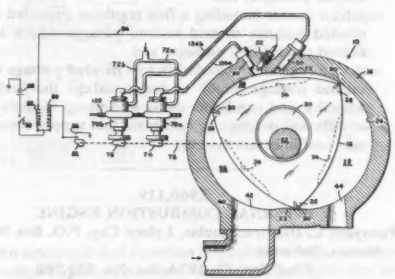
f. normally closed valve means communicably connected to said conduit means, said valve means having a valve body mounted on a lower portion of said reservoir and a valve closure member rigidly mounted on an upper portion of said rubbing means, said valve body having an inlet in said reservoir and an outlet through said reservoir communicably connected to said valve closure member.

3,960,115

STRATIFIED CHARGE ROTARY ENGINE (METHOD OF OPERATION)

Harold D. Lamping, Oakland, and David M. Myers, Upper Saddle River, both of N.J., assignors to Curtiss-Wright Corporation, Wood-Ridge, N.J.

Filed Oct. 4, 1974, Ser. No. 512,342
Int. Cl.² F02B *53/10*
U.S. Cl. 123—8.09 **2 Claims**



1. A rotary combustion engine comprising:

a. an outer body having an internal cavity, the peripheral surface of which has a multi-lobe profile, said outer body also having an air-intake passage and a combustion gas exhaust passage, said air-intake passage being characterized by the absence of any air throttling valve,

b. an inner body of generally polygonal profile mounted for relative rotation within said outer body, the apex portions of said inner body having sealing cooperation with said peripheral surface to define a plurality of working chambers which vary in volume in response to said relative rotation,

c. first and second fuel nozzles each mounted on said outer body for discharging fuel into each engine working chamber after the air charge therein has been substantially compressed,

d. mechanism for regulating the fuel discharged by said nozzles into each engine working chamber, said mechanism including a single engine power control member operable for adjusting said mechanism so that during a relatively low power range of movement of said member the quantity of fuel supplied by the second nozzle remains substantially constant at a relatively low value and the quantity of fuel supplied by the first nozzle progressively increases as said power control member is moved in a power increasing direction, while during a higher power range of movement of the power control member the quantity of fuel supplied by the second nozzle increases at a faster rate than that supplied by the first nozzle as the power control member is moved in a power increasing direction in said higher power portion of its range of movement, and

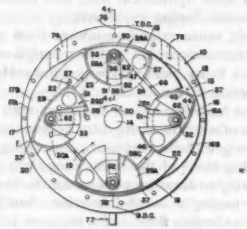
e. ignition means disposed immediately adjacent to said first fuel nozzle such that its electrodes are disposed in a recess in the outer body through which said first fuel nozzle discharges and such that said ignition means ignites fuel promptly as it discharges from said first fuel nozzle.

3,960,116

ROTARY ENGINE

Lawrence Allister Ingham, Box 112, Lanigan, Saskatchewan, Canada

Filed Sept. 16, 1974, Ser. No. 506,202
Int. Cl.² F02B *53/00*
U.S. Cl. 123—8.45 **19 Claims**



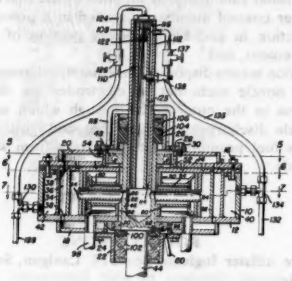
1. In a rotary engine which includes intake and exhaust means, fuel supply means and ignition means, said rotary engine comprising in combination a casing, said casing including a pair of spaced and parallel side walls and an annular ring therebetween having an inner surface and defining with said side walls, a substantially cylindrical chamber therewithin, a main shaft journalled for rotation within said side walls and extending transversely and axially through said casing, a rotor component secured to said shaft within said chamber, and a plurality of piston components pivotally mounted to said rotor around the periphery thereof, each of said pistons being in sealing engagement with said side walls and having a transverse contact strip in sealing engagement with the inner surface of said annular ring, said inner surface of said annular ring being contoured to form a compression lobe on one side thereof and an expansion lobe on the other side thereof substantially diametrically opposite to said compression lobe, each of said piston components including a pair of outer plates and an inner plate therebetween, the inner surface of said outer plates and the outer surfaces of said inner plate being inclined whereby engagement of said inner plate between said outer plates constitutes a circular wedging action, spring means operatively connected between said inner plate and said outer plates and means mounting said plates pivotally upon said rotor, said spring means uring rotative movement between said inner plate and said outer plates thereby urging said outer plates apart and into sealing contact with said side walls of said chamber.

3,960,117

ROTARY ENGINE

Edwin G. Kammerer, 7913 Wharton Ave., Lamont, Calif. 93241

Filed July 10, 1974, Ser. No. 487,318
Int. Cl.² F02B 53/00
U.S. Cl. 123—8.49 3 Claims



1. In a rotary engine, the combination of:
a casing having an inner cylindrical wall;
a rotor in the casing for power output from the engine,
said rotor having at least one pair of lobes in sliding contact with said inner cylindrical wall, said lobes being formed with opposite sloping shoulders;
a plurality of vanes extending inward from said cylindrical wall in pressure contact with the periphery of the rotor, said vanes being yieldingly urged inwardly to follow the configuration of the lobes,
whereby the trailing sides of the lobes with respect to the direction of rotation of the rotor cooperate with the vanes successively to form successive expanding chambers and the leading sides of the lobes cooperate with the vanes successively to form successive contracting chambers,
said rotor having a central interior chamber for a high pressure actuating fluid and a separate interior chamber for exhaust fluid surrounding said central chamber,
an axial end of said chamber for exhaust fluid communicating with stationary exhaust passage means;
stationary means including a fuel combustion chamber cooperative with the rotor to supply high pressure actuating fluid to the first mentioned central chamber in the rotor;
a first set of tubular passages in the rotor extending from said central chamber, through said separate chamber into communication with the trailing sides of the lobes respectively to deliver the actuating fluid to the successive expanding chambers; and
a second set of tubular passages in the rotor extending from said separate chamber into communication with the leading sides of the lobes respectively to exhaust the successive contracting chambers.

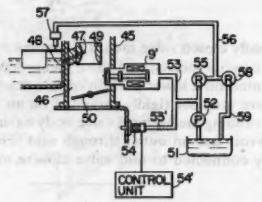
3,960,118

AIR-FUEL RATIO ADJUSTING DEVICE IN AN INTERNAL COMBUSTION ENGINE HAVING A CARBURETOR

Toshiaki Konomi, Susono, and Hiroshi Koide, Okazaki, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed May 15, 1974, Ser. No. 470,304
Claims priority, application Japan, May 16, 1973, 48-53525
Int. Cl.² F02B 3/00; F02D 1/06
U.S. Cl. 123—32 EA 1 Claim

1. An air-fuel ratio adjusting device for use in an internal combustion engine having a carburetor including a main fuel supply system, comprising:
an oxygen sensor provided in the exhaust system of said internal combustion engine for detecting oxygen concentration in the exhaust gas;
a control unit connected to said oxygen sensor including means for comparing the air-fuel ratio in the air-fuel mixture in the engine with the theoretical air-fuel ratio through the detected oxygen concentration and generating a control signal corresponding to the difference between the engine air-fuel ratio and the theoretical air-fuel ratio, and means for continuously generating a pulse signal with a time interval initiated in response to the engine rotation, the pulse width of said pulse signal being varied in response to said control signal;
an electromagnetic fuel injection system provided separately from said main fuel supply system in the carburetor, and having a solenoid valve means energized by said varied pulse signal of said control unit;



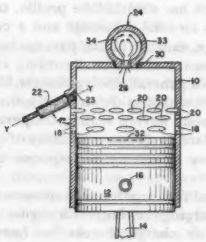
a first passage connected to said fuel injection system at its one end and connected to a fuel tank at its other end;
a second passage connected to said main fuel supply system at its one end and divided at its other end into two passages, one of which is connected to the fuel tank and the other of which is connected to said first passage;
a pump provided in said first passage at a position between the fuel tank and the point of connection of said first and second passages; and
regulator means including a first regulator provided in said divided passage of said second passage which is connected to said first passage, and
a second regulator provided in said divided passage of said second passage which is connected to the fuel tank, whereby said regulators cause said pump to deliver fuel at different pressure to said main fuel supply system and said fuel injection system.

3,960,119

INTERNAL COMBUSTION ENGINE

Panayotis C. Dimitracopoulos, Lyford Cay, P.O. Box N-7776, Nassau, Bahamas

Filed Dec. 17, 1974, Ser. No. 533,706
Int. Cl.² F02B 23/00
U.S. Cl. 123—32 C 8 Claims



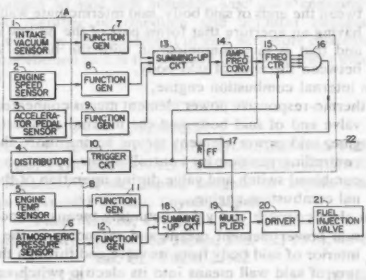
1. An internal combustion engine having a cylinder in which a piston is arranged to reciprocate, comprising:

a. said cylinder having a closed top formed with a passageway coaxial to the axis of said cylinder;
b. a blind and substantially spherical ignition chamber coaxial to said cylinder communicating with said cylinder through said passageway, said ignition chamber consisting of a continuously smooth, unbroken wall devoid of any mechanical elements or irregularities,
c. said passageway having a smoothly curved convex internal wall forming a throated restriction between said cylinder and said ignition chamber;
d. fuel-injection means disposed on the cylindrical wall of said cylinder, including means for injecting at low pressure substantially large droplets of fuel in said cylinder in the general direction of said passageway;
e. air-admission means and exhaust means arranged on the cylindrical wall of said cylinder.

3,960,120
ELECTRONIC FUEL INJECTION CONTROL CIRCUIT FOR AN INTERNAL COMBUSTION ENGINE

Shigeo Aono, Seki, and Makoto Anzai, Yokosuka, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed May 21, 1975, Ser. No. 579,711
Claims priority, application Japan, June 21, 1974, 49-70289
Int. Cl.[2] F02B *3/00*
U.S. Cl. 123—32 EA **10 Claims**



1. An electronic fuel injection control circuit for an internal combustion engine with means for producing a signal synchronized with the revolution of the engine, comprising:

a plurality of sensing devices for generating signals representative of operating conditions of said engine;

function generating means coupled to each said signal sensing device for rectilinearly relating each operating condition to the amount of fuel to be supplied to said engine;

means coupled to each said function generating means for summing up the outputs therefrom;

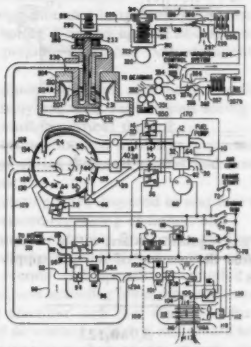
an amplitude-to-frequency converter to produce a train of pulses the pulse repetition frequency of which is exponentially inversely proportional to the input amplitude, said converter being coupled to said summing up means to remove the discontinuities of the rectilinear approximation; and

a pulse forming circuit including a counter coupled to said converter for counting the pulses therefrom to produce an output when a predetermined number is reached and arranged to be cleared by the synchronous signal, and a flip-flop arranged to be set by the output from said counter and reset by said synchronous signal.

3,960,121
ENGINE COMBUSTION SYSTEM

Harold Adams Backus, Wynnewood, Pa., assignor to Backus Devices, Incorporated, Pa.

Continuation of Ser. No. 153,584, June 16, 1971. This application May 30, 1974, Ser. No. 474,791
Int. Cl. F02b *3/00, 43/08;* **F02m** *31/00*
U.S. Cl. 123—34 A **17 Claims**



1. A combustion system for an engine comprising air pressurizer means for providing pressurized air, fuel pressurizer means for providing pressurized fuel, preburner means connected to said air pressurizer means and fuel pressurizer means for producing a hot gaseous admixture of fuel vapor and products of combustion which is heated to the temperature for autoignition of said gaseous admixture in air, means defining a combustion space within said engine, fuel release valve means connected to the output of preburner for controlling the release of the said hot gaseous admixture into said combustion space, and means for supplying preheated air to said combustion space to provide burning of said admixture in said preheated air, said preburner means comprising a mixing chamber, at least one fuel nozzle for injecting pressurized fuel into said chamber, at least one air nozzle for injecting a jet of pressurized air into said chamber at least a portion of which jet effects turbulent motion within said chamber so as to cause mixing of said fuel and said air, heating means for aiding in igniting the pressurized fuel, and sensing means responsive to the temperature within said chamber for controlling the output of said fuel nozzle.

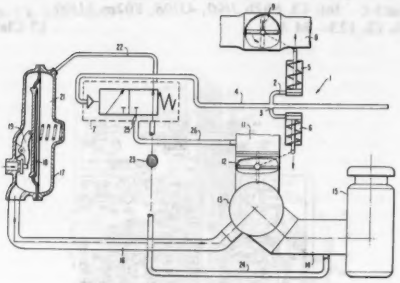
3,960,122
ENGINE EXHAUST BRAKE FOR OTTO-ENGINES OPERATED WITH GAS

Günter Perrin, Stuttgart, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany

Filed Mar. 29, 1974, Ser. No. 456,292
Claims priority, application Germany, Mar. 30, 1973, 2315947
Int. Cl.[2] F02D *31/00, 35/02*
U.S. Cl. 123—97 B **19 Claims**

1. An engine exhaust brake for a motor vehicle operated by a gas engine, which upon its engagement causes the closing of an exhaust gas line with the aid of an exhaust brake valve means and the opening of a throttle valve controlling the mixture supply, a gas-air mixer means arranged upstream of the throttle valve, and a diaphragm controlled gas regulator means including an output stage having a vented side operatively connected with the atmosphere by way of an air line, the gas supply of the gas-air mixer means being controlled by said output stage, characterized in that a control valve means is

connected in said air line which is controllable by engagement of the engine brake and which upon engagement of the engine brake is operable to connect the vented side of the output



stage of the gas regulator means with a vacuum source whose vacuum causes the closing of the gas supply to the gas-air mixer means.

3,960,123

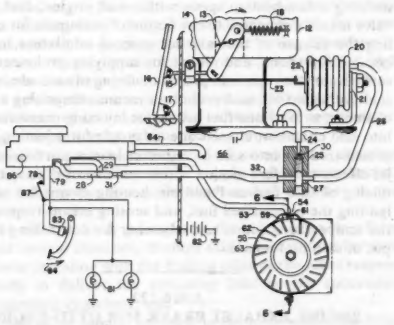
ENGINE SPEED MAINTAINING APPARATUS

Kenneth L. Berninger, 7225 N. Dearborn Ave., Indianapolis, Ind. 46240

Filed Oct. 4, 1974, Ser. No. 512,083

Int. Cl.[2] F02D *11/08*

U.S. Cl. 123—103 R **11 Claims**



1. An engine speed responsive control for an internal combustion engine comprising:

an engine fuel intake control;

a fluid operated driver for said intake control;

a pressure responsive control valve means coupled to said driver and operable upon sensing a pressure above a predetermined level to disable said driver,

said control valve means including a first input for a source of pressure, a valve port, and a valve member operable to normally close said valve port but movable to open said valve port;

an engine driven fan;

a pressure pick-up at said fan to develop pressure in response to fan motion; and

a conduit coupling said pick-up to said first input for transmitting to said input, pressure from said pick-up.

3,960,124

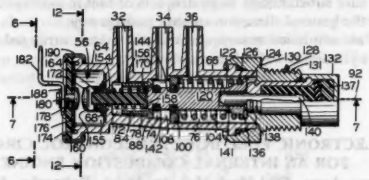
POLLUTANT EMISSION CONTROL SYSTEM AND A COMBINED ELECTRIC SWITCH AND TEMPERATURE RESPONSIVE VALVE THEREOF

Frank Payne, Knoxville, Tenn., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Jan. 20, 1975, Ser. No. 542,633

Int. Cl.[2] F02P *5/04*; F01P *5/14*

U.S. Cl. 123—117 A **14 Claims**



1. A combined electric switch and temperature responsive valve for a pollutant emission control system of an internal combustion engine, said combined switch and valve comprising

a tubular body having a valve end and an electric switch end and a generally hollow interior between the ends of said body,

an intermediate wall means interposed between the ends of said body for partially dividing the hollow interior between the ends of said body, said intermediate wall means having an aperture that forms part of the hollow interior and that is in communication with the hollow interior between the ends of said body,

an internal combustion engine,

a thermo-responsive power element means connected to the valve end of said body and the internal combustion engine, said power element means having more than one controlling position for controlling the operation of said combined switch and valve during operation of the internal combustion engine,

an electic switch and valve actuating means connected to said power element means and extending in the hollow interior of said body from its valve end through the aperture of said wall means into its electric switch end, said electric switch and valve actuating means having an outer electric switch end portion at the electric switch end of said body,

the electric switch end of said body having spaced electric contact terminal means and an electric bridging means for electrically interconnecting said spaced electric contact terminal means,

said bridging means being slidably mounted on the outer electric switch end portion of said electric switch and valve actuating means at the electric switch end of said body,

means on the outer electric switch end portion of said electric switch and valve actuating means for retaining said bridging means on the outer electric switch end portion, and

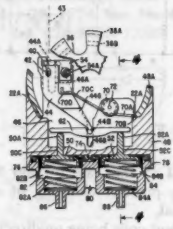
spring means interposed between said bridging means and said intermediate wall means and urging said bridging means into engagement with said spaced electric contact terminal means when said electric switch and valve actuating means is moved in a direction towards the electric switch end of said body upon actuation of said thermo-responsive power element means from one controlling position to another as said combined switch and valve is operated during operation of the internal combustion engine.

3,960,125

DUAL VACUUM ACTUATOR IGNITION TIMING

Richard W. Mattson, Rossford, Ohio, assignor to Eltra Corporation, Toledo, Ohio

Filed Dec. 17, 1973, Ser. No. 425,430
Int. Cl.² F02P 5/04
U.S. Cl. 123—117 A 1 Claim



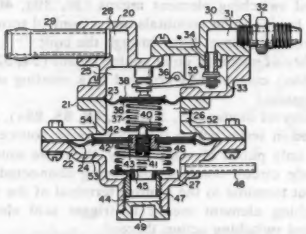
1. A dual vacuum advance distributor for an engine comprising a timing rotor, a movable member, a coil carried by said movable member, said movable member being adapted to move said coil generally tangentially relative to said rotor, first and second actuators which are independently operable and are disposed for generally parallel movement and a proportioning yoke, said first actuator engaging said yoke so that movement of said first actuator causes movement of said yoke, said second actuator engaging said yoke remotely from said first actuator so that movement of said second actuator causes movement of said yoke independently of the movement caused by said first actuator, said yoke engaging said movable member intermediate said actuator engagement points, whereby any movement of said actuators is summated and proportioned as it is transmitted to said movable member by said yoke.

3,960,126

PRESSURE REGULATOR OF LIQUEFIED-GAS FUEL SYSTEM FOR INTERNAL COMBUSTION ENGINES

Kazuo Shinoda, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed May 20, 1974, Ser. No. 471,193
Claims priority, application Japan, Jan. 12, 1974, 49-6793
Int. Cl.² F02M 21/02
U.S. Cl. 123—120 10 Claims



1. A pressure regulator for a liquefied-gas fuel system in an internal combustion engine comprising:

a. a regulator body forming a space partitioned into three chambers; namely,

i. a pressure-regulating chamber communicating with a liquefied-gas fuel source and a carburetor, said pressure-regulating chamber having a fuel inlet passage communicating with said liquefied-gas fuel source, and a fuel outlet passage communicating with said carburetor;

ii. a back-pressure chamber communicating with the atmosphere; and

iii. a suction-pressure chamber communicating with an intake system of said engine by an intake port coupled to an intake manifold such that a vacuum is selectively formed in said suction-pressure chamber;

b. a first diaphragm forming a boundary between said pressure-regulating chamber and said back-pressure chamber;

c. a second diaphragm forming a boundary between said back-pressure chamber and said suction-pressure chamber;

d. a first spring mounted in said suction-pressure chamber, said first spring disposed against said second diaphragm and said pressure-regulating body adjacent the bottom thereof;

e. a screw adjustment means secured in said first diaphram for selectively engaging said second spring and limiting the downward movement thereof;

f. a second spring mounted in said back-pressure chamber, said second spring disposed against said first and second diaphragms;

g. a fuel regulating valve disposed in said fuel inlet passage of said pressure-regulating chamber; and

h. an actuating lever having first and second ends, said first end operatively connected to said fuel regulating valve and said second end operatively coupled to said first diaphragm, said actuating lever disposed in said pressure-regulating chamber such that when said first diaphragm is disposed downward, said first end of said lever is caused to deactuate said regulating valve thereby decreasing the amount of fuel supplied to said pressure-regulating chamber, and when said first diaphragm is disposed upward, said first end of said lever is caused to actuate said regulating valve thereby increasing the amount of fuel supplied to said pressure-regulating chamber,

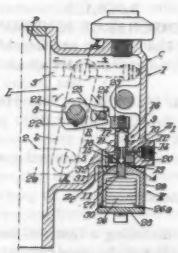
said first and second springs are arranged and configured in said pressure-regulator such that for predetermined pressures in three chambers, said actuating lever is caused to selectively regulate the fuel supplied to said pressure-regulating chamber.

3,960,127

DEVICE FOR REGULATING THE DELIVERY OF A FUEL INJECTION PUMP OF AN INTERNAL COMBUSTION ENGINE

Andre Vuaille, Lyon, France, assignor to Sigma Diesel, Uenissieux, France

Filed Oct. 29, 1974, Ser. No. 519,013
Claims priority, application France, Oct. 30, 1973, 73.38636
Int. Cl.² F02D 1/04, 1/06
U.S. Cl. 123—140 MP 7 Claims



1. A device for regulating the delivery of a fuel injection pump of an internal combustion engine, comprising:

a control member movable in dependence upon the speed of the engine;
a regulating member for adjusting the delivery of the injection pump;
a transmission lever for transmitting movement of said control member to said regulating member, said transmission lever having its ends pivotally connected to said control member and said regulating member respectively;
a casing housing said control member, said regulating member and said transmission lever;
a pivot having a geometric axis, said pivot being mounted on said casing for rotation about said geometric axis;
a spindle connected to said pivot for rotation with said pivot, said spindle being parallel to and eccentric with respect to the geometric axis of said pivot, said transmission lever being freely rotatably mounted on said spindle intermediate the ends of said transmission lever; and
actuating means sensitive to a controlling fluid pressure for rotating said pivot, thereby to move said regulating member to adjust the delivery of the injection pump in response to changes in said controlling fluid pressure;
in which device said actuating means comprise:
a differential piston having first and second working surfaces with said first surface of smaller area than said second surface;
a cylinder receiving said differential piston and defining with said first and second surfaces of said piston respective first and second chambers with said first chamber of smaller cross-sectional area than said second chamber, said first and second chambers being permanently connected together by a linking duct of small cross-section, said cylinder having an inlet for introducing working fluid to said first chamber;
a pilot valve defining with said differential piston a variable throttle section for connecting said second chamber to a low pressure region into which said working fluid is discharged; and
a deformable unit comprising a resilient metal bellows having an evacuated interior and sensitive to said controlling fluid pressure and operatively coupled to said pilot valve such that said pilot valve is rigidly and directly fixed on said deformable unit so as to adjust the position of said pilot valve in response to changes in said controlling fluid pressure, said differential piston comprising an axial bore having one end receiving said pilot valve and the other end provided with orifices in communication with said low pressure region, said pilot valve comprising a longitudinal blind bore opening into said axial bore adjacent to said orifices of said other end, said pilot valve comprising a cylindrical surface formed with at least one orifice communicating with said axial bore in said piston to form said variable throttle section.

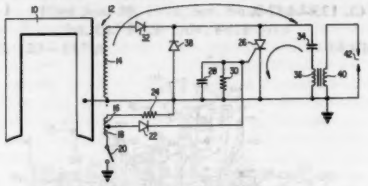
3,960,128

CAPACITOR DISCHARGE IGNITION SYSTEM

Harold E. Anderson, Los Angeles, and Gerald T. Kiner, Lawndale, both of Calif., assignors to McCulloch Corporation, Los Angeles, Calif.

Filed Oct. 15, 1974, Ser. No. 514,603
Int. Cl.² F02P *1/00*
U.S. Cl. 123—148 E **7 Claims**

1. An ignition circuit for an internal combustion engine comprising:
a two-legged magnetic member;
a capacitor;
a charging circuit including a first coil for periodically applying a unidirectional charging current to said capacitor responsively to engine rotation;
a discharge circuit for said capacitor, said discharge circuit including the primary winding of an ignition transformer and an SCR connected in series;
a trigger circuit including a first plurality of turns of a second coil for periodically applying a triggering potential to the gate of said SCR responsively to engine rotation; and,
selectively operable means including a second plurality of turns of said second coil for periodically applying a trig-



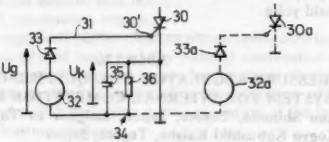
gering potential to the gate of said SCR in sufficient synchronism to prevent charging of said capacitor to ignition potential,
said first and second coils being unidirectionally wound on one leg of said two-legged magnetic member.

3,960,129

COMPENSATED SEMICONDUCTOR IGNITION SYSTEM FOR INTERNAL COMBUSTION ENGINES

Walter Hofer, Schwabach; Georg Haubner, Berg, and Peter Schmaldienst, Nurnberg, all of Germany, assignors to Robert Bosch G.m.b.H., Gerlingen-Schillerhohe, Germany

Division of Ser. No. 330,689, Feb. 8, 1973, abandoned. This application Feb. 3, 1975, Ser. No. 546,195
Claims priority, application Germany, Mar. 10, 1972, 2211534
Int. Cl.² F02P *5/04*
U.S. Cl. 123—148 CC **8 Claims**



1. Ignition system for a multi-cylinder internal combustion engine having
a main ignition circuit including an ignition coil (**14**), spark plug means (**17**) connected to the ignition coil, and controlled switching element means (**30, 30*a*, 40, 60, 80, 80*a***) having main terminals and a control terminal, and controlling current flow through the coil;
a plurality of magnetic pulse source means (**32, 32*a*, 45, 68, 84, 84*a***) magnetically coupled to a rotating element of the system;
a plurality of diodes (**33, 33*a*, 47, 69, 85, 85*a***), each connected in series with a respective pulse source means to pass only pulses of one polarity, the pulse source means - diode circuit combinations being connected with one output terminal to the control terminal of the controlled switching element means to trigger said element and control switching action thereof;
a common resistor-capacitor (R/C) circuit (**35, 36; 42, 43, 44*a*; 66, 67, 87, 88**) forming a compensation circuit (**34, 41, 65, 86**) in which the resistance portion and the capacitance portion of the circuit are connected in parallel, connecting the other respective terminals of each of the pulse source means-diode combinations (**32–33; 32*a*–33*a*; 45–47; 68–69; 84–85; 84*a*–85*a***) to one of the main terminals of the controlled switching element means (**30, 30*a*, 40, 60, 80, 80*a***) whereby the common compensation circuit (**34, 41, 65, 86**) is connected in the circuit

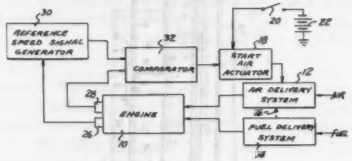
path between the main terminal of the controlled switching element means and said other terminal of the pulse source means.

3,960,130

START AIR CONTROL SYSTEM

William A. Peterson, Jr., Royal Oak, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Filed May 28, 1974, Ser. No. 473,621
Int. Cl.² F02N 17/00
U.S. Cl. 123—179 A **22 Claims**



1. A start air control system for an internal combustion engine having an air delivery system including a throttle controlled air intake manifold and cranking means for starting the engine comprising:

means sensing engine operating conditions including engine speed and engine temperature for generating a start termination signal when engine speed exceeds a reference speed having a value determined by engine temperature; and

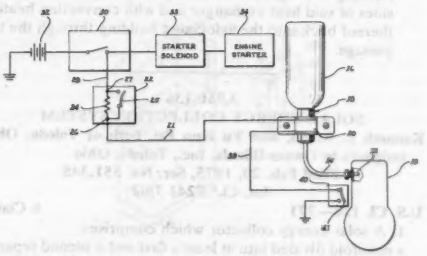
start air control means for generating an output signal operative to provide a predetermined engine input air flow during engine starting, said start air control means having a first state generating said output signal and switched to a second state terminating said output signal in response to said termination signal.

3,960,131

INTERNAL COMBUSTION ENGINE STARTING SYSTEM

Bill G. Davis, Phoenix, Ariz., assignor to Jetco, Inc., Phoenix, Ariz.

Filed Nov. 29, 1974, Ser. No. 528,561
Int. Cl.² F02M 1/16
U.S. Cl. 123—187.5 R **1 Claim**



1. In an electrically actuated series connected starting system for a water jacket encased internal combustion engine having a starter switch connected to a battery, the improvement comprising in combination:

a. a container for storing a volatile starting fluid under pressure;

b. an electrically actuatable discharge means connected to said container for discharging the starting fluid from said container, said discharge means including an electrically actuated solenoid means for metering a predetermined quantity of the fluid upon electrical energization of said discharge means and for discharging the predetermined quantity of the starting fluid upon electrical de-energization of said discharge means;

c. conduit means extending from said discharge means to the engine for transmitting the discharged predetermined quantity of the starting fluid from said discharge means to the engine;

d. a timing switch electrically connected in series between the starter switch and said discharge means for periodically electrically energizing said discharge means, said timing switch including a current limiting heating element connected in parallel with a normally open bimetallic relay responsive to said heating element for periodically establishing a short circuit across said heating element;

e. a normally closed thermostatic switch mounted adjacent the water jacket of the engine for sensing the ambient temperature of the engine, said thermostatic switch being actuated in response to a predetermined ambient temperature of the engine;

f. electrical conductor means for electrically connecting said thermostatic switch to said discharge means; and

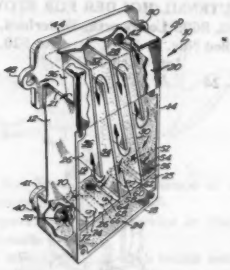
g. further electrical conductor means for electrically connecting said thermostatic switch to the battery; whereby, the starting fluid is continually periodically discharged into the engine until either the starting switch is turned off or until the engine reaches an ambient temperature, whichever occurs first.

3,960,132

DEVICE FOR LUBRICATING AN INTERNAL COMBUSTION ENGINE WITH POWDERED GRAPHITE

Chester O. Goserud, 3205 Woodbridge St., St. Paul, Minn. 55112

Filed Jan. 13, 1975, Ser. No. 549,395
Int. Cl.² F01M 1/00
U.S. Cl. 123—196 CP **5 Claims**



1. In combination with an internal combustion engine having a crankcase, a device for lubricating the internal combustion engine with powdered graphite comprising:

a. a housing connected to the crankcase of the internal combustion engine externally thereof and having

b. an inlet opening at one end of the housing for connection with an outlet opening in the crankcase of an internal combustion engine and

c. an outlet opening at the other end for connection with an inlet opening of the crankcase of an engine;

d. means for connecting said inlet opening of said housing to the outlet opening of a crankcase of an engine,

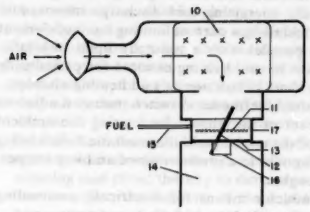
e. means connecting said outlet opening of the housing to the inlet opening of a crankcase,

f. a breather opening formed in said housing,

g. means in said housing for collecting graphite carried by airflow through the housing from the inlet opening to the outlet opening and prior to said outlet of said housing and said breather opening, and

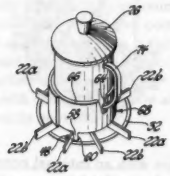
h. valve means for causing the collected graphite in the housing to exit out said outlet of said housing.

3,960,133
FUEL SAVING APPARATUS
James W. Donovan, Washington, D.C., assignor to Barry J. Nace, Washington, D.C., a part interest
Filed Mar. 1, 1974, Ser. No. 447,277
Int. Cl.² F02B 77/00
U.S. Cl. 123—198 R 5 Claims



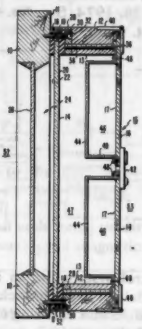
1. An improved gasket comprising a gasket body and a multiple-sided appendage securely fastened to said gasket body in combination with a carburetor containing a fuel flow control valve and an intake manifold wherein said improved gasket is disposed between said carburetor and said intake manifold whereby said appendage of said gasket controls the extent to which said fuel flow control valve can open when said valve contacts said appendage, said fuel flow control valve controlling the flow of fuel from said carburetor to said intake manifold.

3,960,134
UTENSIL HOLDER FOR STOVE
Elmira J. Scott, 8605 Longworth, Waterford, Mich. 48095
Filed Nov. 4, 1974, Ser. No. 520,473
Int. Cl.² F24C 15/10
U.S. Cl. 126—24 7 Claims



1. A device providing means for restraining an object such as a cylindrical cooking utensil from inadvertently or accidentally falling from a stove having a horizontally-disposed heating element and/or grate, said device comprising first means for restraining the utensil, said first means comprising a tubular, sheet metal or other body having upper and lower open ends, said body being split between said upper and lower ends to provide free ends at said split and adapted to receive untensils through said upper open end, said free ends of said body at said split being formed to overlap, whereby said body is resiliently expandable from its free-state overlapping configuration to substantially circumscribe utensils of varying diameters, and second means for removably securing said device to the stove, said second means comprising means extending from said lower open end and formed to have a side opening therein for receiving a portion of the stove heating element or grate upon horizontal movement of said second means.

3,960,135
SOLAR HEATER AND THERMAL BARRIER
Domenick J. Angiletta, 223 E. Knight Ave., Collingswood, N.J. 08108
Filed Nov. 26, 1974, Ser. No. 527,486
Int. Cl.² F24J 3/02
U.S. Cl. 126—270 7 Claims



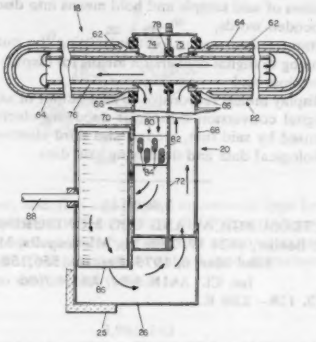
1. A solar heater for attachment to the inside of windows of buildings comprising:
a box assembly having a rear panel member including heat exchanger means and top, bottom and spaced side panels forming a box enclosure with said rear panel and having air passages in at least one of said panels; and
means for removably attaching said box enclosure to a window sash to enclose the sash and with said rear panel spaced from and projecting inside the associated building from the window of the associated sash;
said heat exchanger means including a member of high thermal conductivity and having a surface of high heat absorptivity and being attached to said rear panel and spaced therefrom and from the sash for receiving solar radiation passing through the associated sash window and for heating air enclosed within said box assembly and passing on both sides thereof;
said air passages being located at the top and bottom of said box assembly for passing air from inside the associated building through the bottom passage upwards on both sides of said heat exchanger and with convection heating thereof back into the associated building through the top passage.

3,960,136
SOLAR ENERGY COLLECTION SYSTEM
Kenneth L. Moan, and Yu Kun Pei, both of Toledo, Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio
Filed Feb. 20, 1975, Ser. No. 551,345
Int. Cl.² F24J 3/02
U.S. Cl. 126—271 6 Claims

1. A solar energy collector which comprises:
a manifold divided into at least a first and a second separate compartment;
a connecting tube extending through said first and said second compartments, said connecting tube extending beyond both said first and said second compartments into the outside atmosphere;
a first double wall transparent glass tube, the space between said double walls being sealed at a sub-atmospheric pressure, having a closed end, and an open end enveloping that portion of said connecting tube extending beyond said second compartment and in communication with said second compartment;
a second double wall transparent glass tube, the space between said double walls being sealed at a sub-atmospheric

pressure, having a closed end, and an open end enveloping that portion of said connecting tube extending beyond said first compartment and in communication with said first compartment;

a gas, filling said manifold, connecting tube and said first and second double wall tubes;



means for propelling said gas in an endless cycle from one compartment to the other, through said connecting tube, through both of said first and second double wall tubes in counter flow to the path of flow through said connecting tube and into the other compartment of said manifold; and

a heat exchanger, mounted in the path of flow of said gas from said second compartment to said first compartment.

3,960,137

APPARATUS FOR FRYING FOOD BY IMMERSING IT IN BOILING OIL

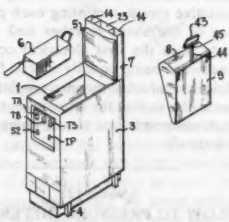
Charles Schmid, 12 Chemin de Chantemerle, Orbe, Vaud, Switzerland

Filed Sept. 13, 1974, Ser. No. 505,985

Claims priority, application Switzerland, Sept. 25, 1973, 13813/73

Int. Cl.[2] A47J *21/02*

U.S. Cl. 126—387 **3 Claims**



1. A deep-fryer for frying food in oil, comprising

1. a deep tank having two opposed side walls defining a central part of the tank therebetween, an upper part thereabove and a settling chamber therebelow,

2. a removable filling member mounted in the central part of the deep tank, the filling member having two opposed side walls adjacent respective ones of the tank side walls and an upper wall,

a. the upper wall of the filling member delimiting a frying vat in the tank for an oil bath wherein the food is immersed for frying,

b. one of the tank side walls and the adjacent filling member side wall defining an upstream oil circulation duct portion beginning at the upper filling member wall and in communication with the frying vat,

c. the other tank side wall and the filling member side wall adjacent thereto defining a downstream oil circulation duct portion constituted by a narrow slit and ending at the upper filling member wall, the slit being in communication with the upstream duct portion and the frying vat, the upstream and downstream duct portions forming a looped circulation duct for the oil, and

d. the settling chamber being in communication with the central part of the tank through a constricted passage arranged between the upstream and downstream duct portions,

3. means for heating the other tank side wall and thus to heat the oil ascending in the narrow slit into the frying vat while oil cooled in the frying vat descends through the upstream oil circulation duct, the descending oil depositing waste and water of condensation by gravity through the constricted passage into the settling chamber, and the cooled oil passing into the narrow slit to be heated therein, and

4. an emptying cock for discharging the waste and water of condensation from the settling chamber.

3,960,138

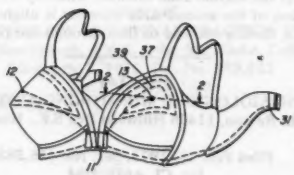
DIFFERENTIAL TEMPERATURE INTEGRATING DIAGNOSTIC METHOD AND APPARATUS

James D. Doss, and Charles W. McCabe, both of Los Alamos, N. Mex., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Jan. 6, 1975, Ser. No. 539,130

Int. Cl.[2] A61B *5/00*

U.S. Cl. 128—2 H **8 Claims**



1. A method for detecting the presence of a tumor in a human breast comprising the steps of:

placing a temperature sensing device in thermal contact with each breast;

measuring the temperature of each breast individually;

determining the temperature difference between said breasts measuring the time said temperature sensing devices are in thermal contact with said breasts;

integrating the temperature difference with respect to time; and,

indicating the integrated temperature difference.

3,960,139

SYRINGE DEVICE WITH MEANS FOR REMOVING CONTAMINATES WHEN DRAWING BLOOD SAMPLE

Donald L. Bailey, 11018 Muriel Place, Thornton, Colo. 80233

Filed Jan. 15, 1975, Ser. No. 541,150

Int. Cl.[2] A61B *5/14*

U.S. Cl. 128—2 F **6 Claims**

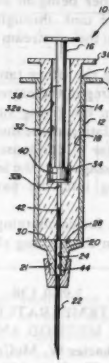
1. A syringe for drawing blood comprising:

a tubular body having a leading end with an opening therethrough and connection means in communication with said opening at said leading end for connection to a needle adapted to be inserted into a donor's blood vessel to transfer blood from the blood vessel to the tubular body, and an open trailing end,

a needle connected to said tubular body by said connection means,

a first slide member slidably received in said tubular body in fluid tight relationship therewith, said first slide member having a passage therethrough in communication with said opening in the leading end of the tubular body, and

a second slide member slidably received in said passage in the first slide member in fluid tight relationship therewith, said second slide member having a relatively large portion



being in fluid tight relationship with at least a portion of said passage in the first slide member,

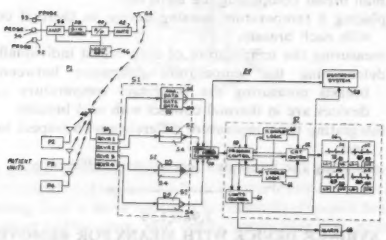
said passage having a notch in the inner wall thereof at the leading end of said portion of the passage in which the second slide member is disposed, said notch extending along a greater length of the passage than the large portion of the second slide member whereby when the large portion of the second slide member is aligned with said notch, fluid is allowed to flow through the passage.

3,960,140

PHYSIOLOGICAL MONITORING SYSTEM

Richard L. Buxton, 11406 Hillwood Dr., S.E., Huntsville, Ala. 35803

Filed Feb. 18, 1971, Ser. No. 116,588
Int. Cl. A61b *5/04*
U.S. Cl. 128—2.06 R **1 Claim**



1. A physiological monitoring system comprising:

A. first, second and third electrodes adapted to be positioned on the body of a patient;

B. a first amplifier adapted to amplify the output of said first electrode and assecond amplifier adapted to amplify the output of said second electrode;

C. an electrical system ground potential point common to said amplifiers;

D. bias means adapted to apply a fixed bias to said third electrode and a patient with respect to said ground potential point of said system;

E. sample and hold means responsive to the outputs of said first and second amplifiers with respect to said third electrode for converting a balanced output to a single ended output of pulses of a predetermined rate and of an amplitude proportional to the input of said sample and hold means;

F. analog to digital conversion means for encoding output pulses of said sample and hold means into discrete binary encoded words;

G. transmission means for transmitting the output of said analog to digital conversion means for display at a remote location; and

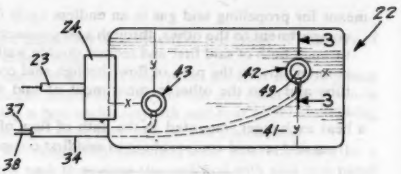
H. display means responsive to said output of said analog to digital conversion means for decoding electrical signals sensed by said first, second and third electrodes as physhological data and displaying said data.

3,960,141

ELECTROSURGICAL AND ECG MONITORING SYSTEM

Lee R. Bolduc, 4624 W. 28th St., Minneapolis, Minn. 55416

Filed Mar. 6, 1975, Ser. No. 556,158
Int. Cl.² A61B *5/04;* **A61N** *3/06*
U.S. Cl. 128—2.06 E **34 Claims**



1. An electrode for use with an electrosurgical apparatus to ground a patient and used with an ECG monitoring instrument to sense bioelectric cardiac signals of a patient comprising: an electrically insulative sheet member having a surface, first electrical conductor means attached to said surface providing a ground electrode adapted to be located in surface contact with the patient, said first electrical conductor means being connectable to the electrosurgical apparatus, second electrical conductor means providing a plurality of bioelectric signal pickup electrodes, means for electrically connectng each pickup electrode with the ECG monitoring instrument, and electrically insulative means mounting each pickup electrode on said surface of the sheet member and separating each pickup electrode from the first electrical conductor means, said pickup electrodes being equally spaced from each other, said first electrical conductor means completely surrounding said pickup electrodes so that the same amount of surface area of the first electrical conductor means completely surrounds each pickup electrode.

3,960,142

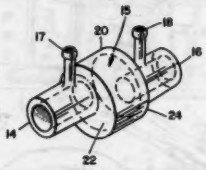
AIR FLOW TO PRESSURE DIFFERENTIAL TRANSDUCER FOR PNEUMOTACHOGRAPHY

Stanley E. Elliott, San Bruno, and Jack H. Shore, San Rafael, both of Calif., assignors to The Institutes of Medical Sciences, San Francisco, Calif.

Filed Dec. 2, 1974, Ser. No. 528,600
Int. Cl.² A61B *5/08*
U.S. Cl. 128—2.08 **8 Claims**

1. An improved air flow to pressure differential transducer adapted to be used by a patient comprising a chamber having at least one sidewall closed by two end walls and enclosing therein a predetermined volume, the distance between said end walls being such that the airflow to or from a patient is normal, said chamber defining an unobstructed volume therewithin; first and second air passages each transpiercing one of

said end walls for the flow of air into and out of said chamber across said unobstructed volume, said air passages having axes of flow offset by an amount equal to or greater than their cross-section at said chamber and each having a unit area equal to or less than one quarter the cross-sectional area of



said chamber; and, first and second manometer taps for measuring the pressure differential of fluid flow between said passages across said chamber, said first manometer tap connected to said first passage and said second manometer tap connected to said second passage.

3,960,143

ENDOSCOPE WITH A TUBE FOR A MEDICAL TREATING INSTRUMENT

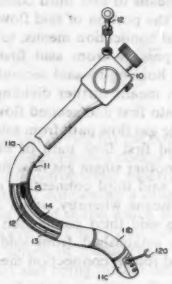
Masaaki Terada, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Aug. 26, 1974, Ser. No. 500,612

Claims priority, application Japan, Aug. 31, 1973, 48-102346[U]

Int. Cl.² A61B *1/00*

U.S. Cl. 128—4 **2 Claims**



1. In a tube disposed in a flexible sheath of an endoscope together with a fiber bundle, a suction tube adapted to receive therethrough a medical treating instrument including a biopsy forceps and a catheter, the improvement comprising constructing said tube of at least two layers superposed one upon the other, one of said layers being an inner layer made of a hard surfaced material having an inner surface of a small frictional coefficient, and the other layer being an outer layer made of a flexible material and thicker than said inner layer, thick enough to prevent the collapse of the inner layer, and as a whole having a thickness equal to 2–5 times the thickness of said inner layer.

3,960,144

EXERCISE AND MASSAGING APPARATUS

Luther G. Simjian, 7 Laurel Lane, Greenwich, Conn. 06830

Filed July 10, 1975, Ser. No. 594,640

Int. Cl.² A61H *11/00*, *7/00*

U.S. Cl. 128—58 **25 Claims**

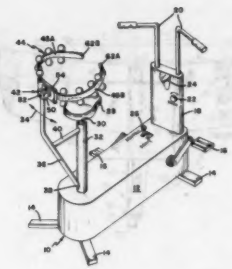
1. An exercise and massaging apparatus comprising in combination:

a stationary support;

pedal means including a rotatable pedal shaft mounted to said support;

a seat supported by said support;

an arm upstanding from said support and mounted for reciprocating rotational motion about a substantially vertical axis;



mounting means disposed at the upper portion of said arm for fastening thereto massaging massagng belt adapted to be secured about the torso of a person sitting on said seat, and

drive means coupled between said pedal shaft and said arm for causing responsive to rotation of said pedal shaft said arm to undergo reciprocating rotational motion and a belt fastened to said mounting means and secured about the torso of a person to undergo a cyclic side-to-side oscillating motion.

3,960,145

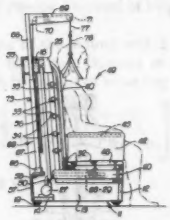
HEAT THERAPY AND SPINAL TRACTION CHAIR

Gilbert R. Scarbrough, 126 S. Olive St., Rialto, Calif. 92376

Filed July 7, 1975, Ser. No. 593,442

Int. Cl.² A61F *5/00*

U.S. Cl. 128—68.1 **3 Claims**



1. An upholstered arm chair, embodying:

seat supporting, arm supporting, and back supporting structures;

a water heating tank underlying and heating the seat supporting structure of the chair;

heating pads embodied in said back supporting and arm supporting structures of said chair and located near the surface thereof, said heating pads comprising watertight envelopes containing flow retarding fibrous packing material therein but permitting ready circulation of hot water through said pads;

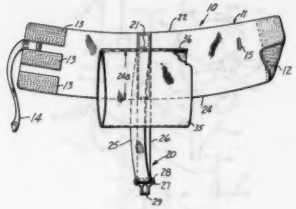
means for automatically circulating water from said heating tank through said heating pads and then returning said water to said tank; and

means for maintaining the water in said tank at a wide range of optional selected temperatures.

3,960,146
TRACTION BELT

Donald Albrecht, P.O. Box 1406, 831 Second St., Santa Monica, Calif. 90406

Filed Mar. 3, 1975, Ser. No. 554,644
Int. Cl.² A61H 1/02
U.S. Cl. 128—75 11 Claims

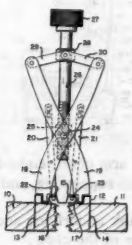


1. A traction belt for application to the torso of a patient comprising a flexible encircling element, fastener means for fastening the encircling element around the torso, a pull-strap having a pair of arms, each arm being attached to a point on the encircling element, said points being spaced apart from one another so that each arm lies adjacent each other for at least the entire length of the free portion of the shorter of the two arms and along a longitudinal dimension corresponding to the spine of the patient, and a connector link slidably fixed to said pull-strap for exerting a pull thereon and dividing the pull-strap into said pair of arms extending between the connector link and the respective points.

3,960,147
COMPRESSION BONE STAPLES AND METHODS OF COMPRESSING BONE SEGMENTS

William M. Murray, 109 Wynnwood Drive, Pittsburgh, Pa. 15215

Filed Mar. 10, 1975, Ser. No. 556,580
Int. Cl.² A61F 5/04
U.S. Cl. 128—92 B 8 Claims

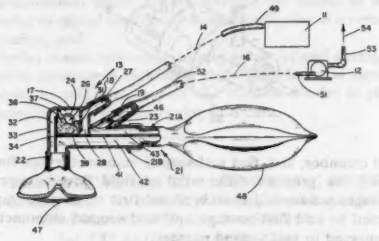


1. An apparatus for placing adjacent bone ends under end to end compression comprising in combination a staple having spaced apart prongs adapted to be forced into adjacent bone ends, said prongs connected by a head member having at least two spaced apart transverse ribs, drive means engaging said ribs to hold the staple during insertion of the prongs into the bone ends to be compressed and means on said drive means forcing said ribs toward one another after said staple is in place so as to urge the prongs together and toe them in.

3,960,148
APPARATUS FOR HIGH FLOW ANESTHESIA

Gale E. Dryden, 5835 N. Tacoma Ave., Indianapolis, Ind. 46220

Filed Oct. 15, 1974, Ser. No. 514,390
Int. Cl.² A61M 16/00
U.S. Cl. 128—188 12 Claims



1. A high flow anesthetic administration unit comprising:

a housing having therein first, second, third, and fourth connection means for connection thereto of gas handling devices, said first means being an inlet for reception of fresh anesthetic mixture, said second means being an outlet-inlet for direct connection to a breathing mask, said third means being an outlet for direct connection to a rebreathing bag, and said fouth means being an outlet for connection to a vacuum line, and said housing having partition means therein defining portions of a single gas flow path in said housing from said first connection means to said second connection means and from said second connection means to said third connection means;

a humidifier in the portion of said flow path from said first to said second connection means, to humidify fresh mixture during passage from said first connection means through said housing to said second connection means, said partition means further dividing said third connection means into first and second flow paths thereby providing a single gas flow path from said second connection means to said first flow path of said third connection means and another single gas flow path from said second flow path of said third connection means to said fourth connection means whereby, when a rebreathing bag is connected to said third connection means, a single gas flow path is established from said second connection means to said fourth connection means via the rebreathing bag.

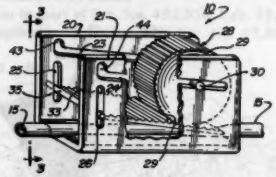
3,960,149
FLOW CONTROL DEVICE

Albert Frank Bujan, Waukegan, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Filed Nov. 13, 1974, Ser. No. 523,294
Int. Cl.² A61M 5/14; F16K 7/06
U.S. Cl. 128—214 R 16 Claims

1. A tubing clamp for regulating flow of fluid through a length of flexible tubing comprising: a clamp body defining a surface for supporting a length of flexible tubing having a longitudinal axis, opposing walls extending from said surface and presenting a passage for said tubing, a platen pivotally mounted between said walls for contacting said tubing wherein the pivot axis is movable transversely to said tubing, guide surfaces arranged in said walls, a rotatable member positioned to be guided and rotated along said guide surfaces, said platen constructed and arranged to be movably positioned between said rotatable member and said tubing, said platen presenting a contact surface for said tubing substantially along and over the path of travel of said rotatable member, and cooperating with said rotatable member to exert an

incremental compressive force on said tubing and by means of said platen to distribute the compressive force of said rotatable member over a wide area of said tubing including a substantial distance along its longitudinal axis.



3,960,150

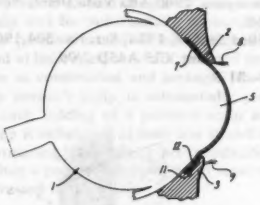
BIOERODIBLE OCULAR DEVICE

Anwar A. Hussain, Lexington, Ky.; Takeru Higuchi, Lawrence, Kans., and John W. Shell, Los Altos, Calif., assignors to Alza Corporation, Palo Alto, Calif.

Continuation-in-part of Ser. No. 179,129, Sept. 9, 1971, abandoned. This application Sept. 15, 1975, Ser. No. 613,384

Int. Cl.² A61M 31/00

U.S. Cl. 128—260 **14 Claims**



1. A bioerodible ocular device for the controlled continuous administration of a predetermined dosage of drug to the eye, comprising a body of hydrophobic bioerodible drug release rate controlling material containing a drug confined therein, the body being of an initial shape which is adapted for insertion in the sac of the eye bounded by the surfaces of the bulbar conjunctiva of the sclera of the eyeball and the palpebral conjunctiva of the lid and being further adapted for retention in said sac during said administration, the body continuously metering the administration of a therapeutically effective amount of drug to the eye at a controlled rate for at least 8 hours by permeation control release, erosion control release or a combination thereof and wherein the body bioerodes in the environment of the eye concurrently with the administration or at a point in time after the administration of the drug.

3,960,151

METHOD AND MEANS FOR THE REPAIR OF PERIPHERAL NERVES

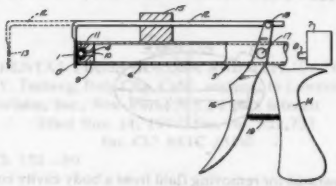
William E. Kuhn, Lexington, Ky., assignor to Hemotec, Inc., Englewood, Colo.

Continuation-in-part of Ser. No. 414,246, Nov. 9, 1973, Pat. No. 3,916,905. This application Mar. 7, 1975, Ser. No. 556,485

Int. Cl.² A61B 17/12

U.S. Cl. 128—334 R **11 Claims**

1. An applicator instrument for applying a tube to the ends of a severed nerve to hold said ends in abutment to effect a sutureless repair of said nerve, said applicator instrument comprising a hollow barrel having a forward end and a rearward end, said rearward end being connectable to a vacuum source, a transverse notch at said forward end of said barrel to receive said tube and serve as a seat therefor, an opening in the region of said seat communicating with the interior of said hollow barrel and with which an evacuation hole in the wall of said tube may be aligned whereby a pressure differential between the interior of said tube and the ambient atmosphere may be developed by means of said vacuum source to draw said nerve ends into said tube, and a retaining means to releasably maintain said tube in said seat.



3,960,152

SURGICAL SUTURES OF UNSYMMETRICALLY SUBSTITUTED 1,4-DIOXANE-2,5-DIONES

Thomas Anthony Augurt, Stamford, Conn.; Michael Norman Rosensaft, Monsey, and Vincent Anthony Parciaccante, Long Island City, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

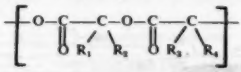
Division of Ser. No. 435,365, Jan. 21, 1974, abandoned. This application Mar. 14, 1975, Ser. No. 558,529

Int. Cl.² A61L 17/00

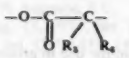
U.S. Cl. 128—335.5 **6 Claims**

1. A method of closing a wound of living tissue which comprises:

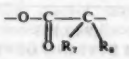
sewing the edges of the wound with a surgical suture consisting of at least one filament of polymer containing more than 2% by weight of recurring units of the formula:



and the remaining units are



and



wherein R_1 and R_2 are not the same as R_3 and R_4, R_1 has at least one carbon atom, and R_1, R_2, R_3, R_4, R_5, R_6, R_7 and R_8 are separately selected from the group consisting of hydrogen, and the radicals methyl, ethyl, propyl, isopropyl, butyl, isobutyl, cyclohexyl, and phenyl,

embedding the suture in living tissue and

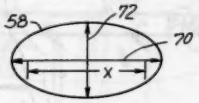
leaving the suture in said tissue until said suture is absorbed by the tissue during the healing process.

3,960,153

APPARATUS FOR THE PALLIATIVE TREATMENT OF PLEURAL EFFUSIONS

Jane Towne Carey, 1161 York Ave., New York, and Alfred Andrew Fracchia, 440 E. 63 St., Plandome, both of N.Y. 10021

Continuation-in-part of Ser. No. 862,434, Sept. 30, 1969, abandoned. This application Feb. 22, 1972, Ser. No. 227,713
Int. Cl.[2] A61B 17/34; A61M 27/00
U.S. Cl. 128—347 12 Claims



1. Apparatus for removing fluid from a body cavity comprising an elongated flexible tube including distal and proximal ends and having at the distal end a closed chamber, said proximal end being adapted for being coupled to a suction source, the tube including a generally cylindrical wall provided with a bore extending substantially throughout the tube from adjacent said chamber to said proximal end, said wall being provided with elliptical openings distributed longitudinally along said wall from adjacent the chamber toward said proximal end along a length of the tube which is less than one-third the total length thereof, and a weight in said chamber, the elliptical openings being substantially the same size and having a major axis of about 8.0 to 10.0 mm., a minor axis of about 4.0 – 50 mm., a distance between foci of about 7.0 to 8.8 mm. and an area of about 0.215 to 0.393 sq. cm.

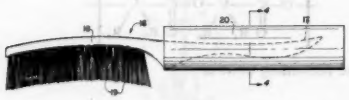
4. Apparatus as claimed in claim 1 comprising trocar means to insert the tube into said cavity, said trocar means including a tapered sleeve and a obturator detachably extending through and conforming to the shape of the sleeve, said obturator having a pointed end extending from the sleeve and adapted for penetrating into said cavity.

3,960,154

NOVEL HAIR GROOMING COMPOSITION, AND A METHOD AND AN INSTRUMENT EMPLOYING THE SAME

Eula Mae Pollard, Rte. 6, Box 713-A, Hot Springs, Ark. 71901

Filed Sept. 16, 1975, Ser. No. 613,893
Int. Cl.[2] A45D 1/00
U.S. Cl. 132—9 10 Claims



1. A solid composition for use in grooming the hair consisting of as active ingredients about 5–15% by volume of bees wax and about 95–85% by volume of paraffin wax.

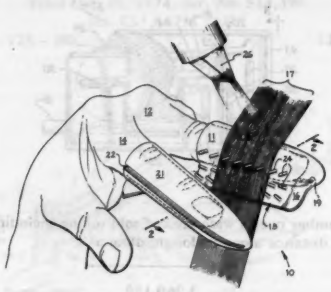
3,960,155

HAIR STYLING DEVICE

Albert Wall, 515 S. Crescent Ave., Lodi, Calif. 95240

Filed Sept. 19, 1975, Ser. No. 614,915
Int. Cl.[2] A45D 1/00
U.S. Cl. 132—9 11 Claims

1. A hair styling device comprising an elongate finger covering semi-rigid material adapted to be disposed onto a finger of a person's hand, said finger covering being formed to include an elongate curling lip carried to protrude alongside said covering while partially underlying another finger of said hand, said lip including a concave surface disposed and adapted to face said outer finger in generally parallel spaced relation flanking a shock of hair when disposed therebetween,



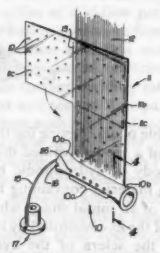
and means interposed between said other finger and said surface serving to positively establish and maintain said spaced relation.

3,960,156

QUICK HAIR END WRAP FOR PERMANENT WAVE

Russell L. Thompson, 2900 Alta Vista Drive, Newport Beach, Calif. 92660

Filed Sept. 9, 1974, Ser. No. 504,196
Int. Cl.[2] A45D 2/00
U.S. Cl. 132—31 R 7 Claims



1. In apparatus for retaining human hair to be waved,

a. a tubular roller, having a side wall containing through perforations, and

b. a flexible re-usable, plastic sheet having film thickness, one end-band portion of the sheet permanently attached to and integral with the roller along the major length thereof to wind the remainder of the sheet onto the roller upon turning thereof, the length of said band portion being less than the length of the roller,

c. said sheet remainder including sections sized to receive hair strands to be retained therebetween and curled as the sections are wrapped in face to face relation about the roller in response to said turning,

d. at least one section containing through perforations distributed substantially uniformly thereover to pass hair treating agent into contact with the hair retained between the sections, and

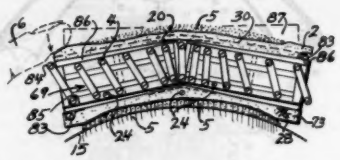
e. an elastic cord extending in stretched condition between opposite ends of the roller and parallel to said end band, the roller being elongated and cylindrical, and a plug telescopically fitting one end of the roller and one end of said cord attached to the plug.

3,960,157

HAIR ROLLERS

Ann Andrews, and Peter Andrews, both of 190 Gebhardt Road, Penfield, N.Y. 14526

Continuation-in-part of Ser. No. 432,576, Feb. 15, 1965. This application June 1, 1970, Ser. No. 42,506
Int. Cl.[2] A45D 2/00
U.S. Cl. 132—40 14 Claims



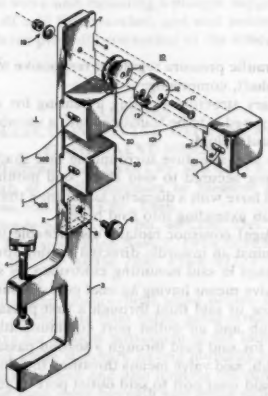
1. A hair roller having an elongated generally tubular-like configuration and comprising in combination: a first body member which is coaxially universally resilient and flexible in at least one portion of its generally elongated tubular-like longitudinal length and being substantially rigid diametrically and round in at lease one portion of its said length, said member having a soft, resilient, flexible and air permeable tubular-like cushioning pad member means substantially embraced around at least one outer diametrical portion of said member for substantially protective cushioning of at least one outer diametrical portion of said length of said member from a person's scalp and for substantially protecting at least one portion of a person's strand of hair which is substantially rolled around at least one portion of said pad member means, said roller is so constructed and arranged that at least one portion of a person's scalp is substantially prevented from becoming numb; balding of a person's scalp is substantially reduced; sleep is enhanced; at least one strand of hair is substantially protected; stiff necks are substantially reduced; especially when a person is sleeping on at least one portion of said roller dressed in their hair.

3,960,158

HAIR WEAVING TENSION SYSTEM

Pansy Simmons, 328 Huey P. Long Ave., Gretna, La. 70053

Filed May 24, 1974, Ser. No. 472,457
Int. Cl.[2] A41G 3/00
U.S. Cl. 132—56 9 Claims



1. A hair weaving tension system for weaving hair wherein said system includes a source of a multiple number of threads, said source comprising:

a support member which is immobile during use:

thread supply means, each including a rotatable spool with thread thereon, mounted on said support member; and

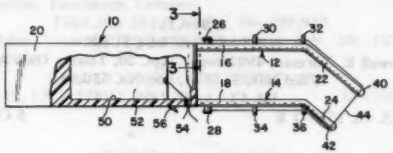
tension applying means also mounted on said support member for applying controlled resistance to the threads coming from said thread supply means when they are pulled by an operator, rotating the spools, in using the threads to weave hair, allowing the operator to secure the threads while weaving under controlled resistance without having to move the position of the thread supply means.

3,960,159

DENTAL FLOSS HOLDER AND APPLICATOR

Allan V. Tesberg, Daly City, Calif., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Nov. 11, 1974, Ser. No. 522,737
Int. Cl.[2] A61C 15/00
U.S. Cl. 132—90 3 Claims



1. Apparatus for dispensing and holding dental floss which comprises: an elongated handle configured for carrying a supply of dental floss, a pair of bent co-planar arms extending fixedly from said handle in spaced apart relationship; said arms respectively formed of elongated generally parallel first sections fixedly joined to said handle and elongated generally parallel second sections fixedly joined to said first sections and making an included angle with said first sections of greater than 90° but less than 180°, means for anchoring opposite ends of a length of said dental floss to said arms comprising generally cylindrical bosses extending substantially perpendicular to the first sections of said arms, each of said bosses having a slot extending along a diameter of said boss, said slot being configured for capturing said dental floss, and means carried by said arms for guiding said length of floss from said anchoring means along said arms and between the free ends thereof, said guiding means including slots formed at the free ends of said arms.

3,960,160

HAIR TREATMENT APPLIANCE

Gary LaDon Hogan, North Augusta, S.C., assignor to LaDon Corporation, North Augusta, S.C.

Filed Aug. 15, 1974, Ser. No. 497,680
Int. Cl.[2] A45D 24/22
U.S. Cl. 132—112 6 Claims

1. A hair treatment appliance comprising:

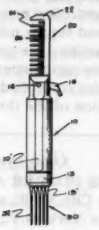
a. an elongated body, said body having a hollow compartment longitudinally thereof, said body having a pair of oppositely positioned slots adjacent an end thereof;

b. a trigger lever pivotally secured within said compartment and extending outwardly through one of said slots in said body, and changing direction outside said body to provide an area for engagement of said trigger;

c. a closure cap secureable at an end of said body opposite said slots, said closure cap having a plurality of elongated hair lifter elements secured thereto and extending outwardly therefrom in a generally parallel arrangement; and

d. an aerosol container receivable in said compartment, said container having a dispensing valve engageable with said

trigger lever, said valve being directed through a slot opposite the slot through which said trigger lever extends



to expel an aerosol spray through said opposite slot when said trigger lever is depressed.

3,960,161

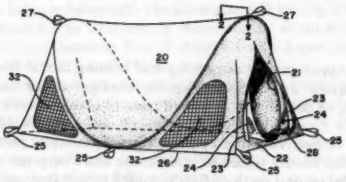
PORTABLE STRUCTURE

Lowell R. Norman, 4902 Secor, Apt. 20, Toledo, Ohio 43623

Filed Nov. 5, 1974, Ser. No. 520,961

Int. Cl.² A45F *1/00, 1/16*

U.S. Cl. 135—1 R **5 Claims**



1. A tent comprising a body of flexible, sheet-like material, a closed loop of a flexible, coilable, springy material as a frame member therefor, said frame member being secured to the periphery of said body in a generally saddle-shaped configuration including two opposed smoothly curved upper ends and opposed smoothly curved lower ends spaced therebetween said lower ends being adapted to be supported by the ground along a limited length thereof, said frame including said length being insufficient to provide stable support to the tent, end panels affixed to said body at each end thereof to form therewith a closed structure said end panels extending beyond the horizontal extent of said body and ties at the lower corners of the end panels adapted to secure the tent to the ground and thereby stably support and tension the tent and hold the frame in the saddle-shaped configuration in use.

3,960,162

VENTED UMBRELLA

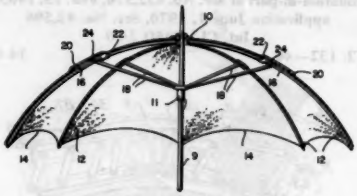
Francois Gilbert Noel, 1719 Nostrand Ave., Brooklyn, N.Y. 11226

Filed Mar. 19, 1975, Ser. No. 559,905

Int. Cl.² A45B *25/22, 25/26*

U.S. Cl. 135—35 V **1 Claim**

1. An umbrella comprising a handle and extension member, ribs secured to and radiating from said member, a cover made of flexible material disposed over said ribs, pivotal struts connected to the ribs and slidably mounted on said member, said cover having at least one opening located below the peak of said umbrella, said opening being located over the pivotal connection of one of said ribs and struts, a clamp embracing said one rib at one end of said opening, a vent adapted to cover said opening, and a flexible arm connecting said clamp and said vent whereby on the outward flexing of said rib below said vent the rib will be flexed downwardly above said vent



and cause said arm to automatically open the vent and relieve the pressure on the pivotal connection of said rib and strut.

3,960,163

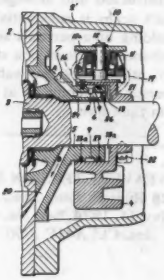
HYDRAULIC PRESSURE REGULATOR

Karl-Heinz Bordowsky, Friedrichshafen; Uwe Brendel, Kressbronn, and Manfred Bucksch, Friedrichshafen, all of Germany, assignors to Zahnradfabrik Friedrichshafen AG, Friedrichshafen, Germany

Filed Feb. 14, 1975, Ser. No. 550,015

Int. Cl.² G05D *13/38*

U.S. Cl. 137—56 **7 Claims**



1. A hydraulic pressure regulator responsive to the speed of a rotating shaft, comprising:

a stationary structure forming a bearing for a shaft whose rotary speed is to be translated into a variable pressure of a hydraulic fluid;

a hub on said structure surrounding said shaft;

a mounting secured to said shaft, said mounting having a central bore with a diameter larger than that of said shaft, said hub extending into said bore;

a centrifugal governor radially displaceable in said mounting against an inwardly directed biasing force; and

valve means in said mounting controlled by said governor, said valve means having an inlet port communicating with a source of said fluid through a first passage formed by said hub and an outlet port communicating with a receiver for said fluid through a second passage formed by said hub, said valve means throttling the flow of said fluid from said inlet port to said outlet port to an extent determined by the outward displacement of said governor;

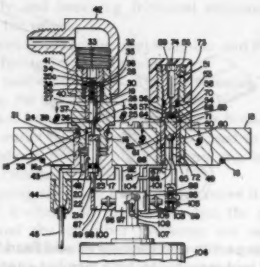
one of said passages including an eccentric hole in said hub, the other of said passages including a clearance between said hub and said shaft.

3,960,164

DEVICE FOR MIXING GASES WITH LIQUIDS

Zar W. Kelley, 8438 Broadview Road, Cleveland, Ohio 44141

Filed May 22, 1974, Ser. No. 472,218
Int. Cl.² B67D 5/34
U.S. Cl. 137—202 2 Claims



1. In a device of the character described, a closed-bottom tank for containing a liquid, a cover plate for said tank removably secured to said tank, means mounted on said plate for admitting liquid into said tank, a normally-closed valve unit mounted on said plate for admitting a gas under pressure through said valve unit and into said tank for charging said liquid with said gas, a second normally-open valve unit mounted on said plate for venting excess gas from the upper end of said tank into the atmosphere, means mounted on said cover plate for dispensing the gas charged liquid from said tank, a completely enclosed float disposed in said tank, said float movable upwardly in the tank in response to filling of the tank with said liquid, means for simultaneously opening said first valve unit and closing said second valve unit in response to said upward movement of said float, said last-named means comprising a shaft supported by said plate, a first member of U-shaped configuration having arms pivotally connected to said shaft, a pin supported by said plate, a second member of U-shaped configuration having arms extending in a direction opposite to that of the arms of said first member and pivotally connected to said pin, a second pin extending through the arms of said second member and parallel with said shaft and first pin, and extension coil springs interconnecting said second pin with the base of said first-named member, and means interconnecting said float with the base of said second member, said first valve unit including a plunger supported by one of the arms of said first member, and said second valve unit including a lever pivotally connected to the other arm of said first member.

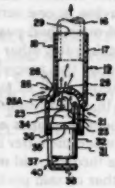
3,960,165

FLUID COLLECTION BOTTLE WITH IMPROVED AIR FLOW VALVE MEANS

Legrand K. Holbrook, Salt Lake City, and Gary F. Sturdevant, Sandy, both of Utah, assignors to Medical Development Corporation, Salt Lake City, Utah

Continuation-in-part of Ser. No. 407,298, Oct. 17, 1974, abandoned. This application Nov. 7, 1974, Ser. No. 521,560
Int. Cl.² A61M 1/00; F16K 31/22
U.S. Cl. 137—202 1 Claim

1. An air-passage closure float valve device including, in combination, an elongate float valve; guide structure housing said float valve for vertical movement of the latter, said float valve and said guide structure having mutually inter cooperable means for enabling and also limiting the downward protrusion of said float valve beneath said guide structure; and a baffle support member having an upper portion secured to said structure, a baffle, and means depending from said upper portion for supporting said baffle in spaced relationship beneath said float valve for all dispositions of the latter, and wherein said guide structure is provided with a downwardly



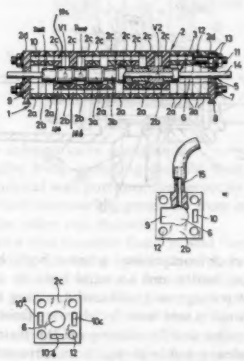
facing recessed seat, said upper portion comprising a ring being secured in said recessed seat.

3,960,166

VALVE ASSEMBLY KIT

Jörg Linser, Heuback-Lautern, Germany, assignor to Artur Fischer, Tumlingen, Germany

Filed July 18, 1974, Ser. No. 489,949
Claims priority, application Germany, July 20, 1973, 2336989
Int. Cl.² F16K 11/00; G09B 23/06
U.S. Cl. 137—271 12 Claims



1. A valve assembly kit for assembling a plurality of different slide valves, comprising a plurality of diverse interchangeable housing components wherefrom an elongated housing element may be assembled, a plurality of spool components wherefrom a valve spool element may be assembled and connecting means; said housing components being of identical contour and each of them being formed with an axially extending main passage portion configurated and dimensioned identically with those of the other of these housing components, so that, when said housing components are coaxially assembled in different sequence and orientation to obtain a selectable configuration of said housing element, an axial main fluid passage is formed from said main passage portions for channeling the flow of fluid in a predetermined path; some of said housing components including fluid ports opening outwardly and also communicating with the main fluid passage portion of the housing components wherein they are formed; one group of said housing components containing one single axially extending lateral fluid passage portion and the other group of said housing components containing several axially extending lateral fluid passage portions, all these lateral fluid passage portions being equally shaped and distributed about, and spacedly from, the periphery of said housing components, so that different positioning and orientation of said housing components in the assembled elongated housing ele-

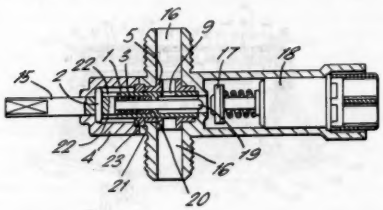
ment provide therein axially extending lateral fluid passages selectably interconnecting said fluid ports and communicating with said main fluid passage; the spool components wherefrom the elongated valve spool element can be assembled being elongate in form and having in one series thereof a diameter smaller than that of said main fluid passage in the assembled housing element and having the other series thereof shaped and dimensioned to be in the assembled housing element engageable with the interior wall of said main fluid passage and slidable therein, so that said assembled spool element, in dependence on the respective shapes and location therein of said spool components, when the latter is shifted, either blocks or frees the fluid passage through said main fluid passage to or from the one and the other of said ports; and said connecting means being formed to be engageable with the housing components for coaxially connecting the same and securing them in respective desired sequencies.

3,960,167

GAS COCK

Bonifacio Echavarri Ros, Cordovilla (Pamplona), Spain, assignor to Orbaiceta, S.A., Spain

Filed June 7, 1974, Ser. No. 477,357
Claims priority, application Spain, June 8, 1973, 415709
Int. Cl.² F16K *11/085*
U.S. Cl. 137—375 **4 Claims**



1. A fluid cock comprising, a valve body having an inlet passageway, an outlet and an axial bore in communication with said inlet passage and said outlet, a plug having an axial portion rotational in said bore for allowing fluid flow from said inlet to said outlet and for closing off the fluid flow, a single elastic inner sleeve solely in said bore circumferentially of a part of said axial portion of said plug in said bore controlling said fluid flow, said valve body having an undercut in said bore within which said sleeve is housed, said sleeve providing a fluid-tight seal between said bore and said sleeve without bonding thereto and between said portion of said plug and the interior of said sleeve, said sleeve extending transversely of said inlet passage, said sleeve having a lateral opening disposed in registry with said inlet passageway for allowing fluid flow through said opening under control of said part of said portion of said plug therein, and a lateral, annular boss on said sleeve intermediate opposite ends of said sleeve defining said lateral opening extending axially into said inlet passageway.

3,960,168

VALVE LOCKING DEVICE

Michael R. Plympton, Houston, Tex., assignor to ACF Industries, Incorporated, New York, N.Y.

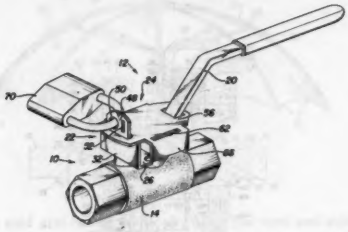
Filed Sept. 4, 1975, Ser. No. 610,475
Int. Cl.² F16K *35/00*
U.S. Cl. 137—385 **12 Claims**

1. A stem locking device for a valve having a body, a rotatable stem and a handle secured to the stem for manual rotation of same between two positions, said locking device comprising:

a. a fixed locking member and a movable locking member;

b. said fixed locking member being mountable on a valve body;

c. said movable locking member being mountable on a handle for relative movement outwardly and inwardly relative to said valve body, and



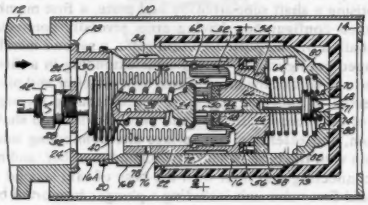
d. interfitting cooperating means on said fixed locking member and said movable locking member engageable at one position upon inward movement of said movable locking member relative to said fixed locking members to prevent rotation of said handle.

3,960,169

PILOT OPERATED EVAPORATOR PRESSURE REGULATOR

Charles D. Orth, Cedarburg, and Charles F. Treder, Brookfield, both of Wis., assignors to Controls Company of America, Schiller Park, Ill.

Continuation of Ser. No. 437,850, Jan. 30, 1974, abandoned.
This application Feb. 3, 1975, Ser. No. 546,527
Int. Cl.² F16K *17/10*
U.S. Cl. 137—491 **2 Claims**



1. A pilot operated valve assembly comprising a cylindrical housing,

a piston in the housing with sufficient clearance to allow the piston to move axially in the housing while dividing it into inlet and pilot chambers,

a pilot valve in the housing end wall,

a sealed bellows fixed on the other end wall and projecting towards the pilot valve,

an actuating pin extending between the bellows and the pilot valve and passing through the piston head,

a spring inside the bellows urging the free end of the bellows towards the pilot valve with a force which, when combined with the internal pressure in the bellows and the force exerted by the bellows, acts to seat the pilot valve when the pressure in the inlet chamber outside the bellows is below a predetermined value,

a bleed hole through the piston head providing flow from the inlet chamber to the pilot chamber at a rate less than the flow rate through the pilot valve when the pilot valve is open a substantial amount and sufficient to equalize the pressures in the two chambers when the pilot valve is closed,

a seal mounted on the piston near the piston head and frictionally engaging the interior of the cylindrical housing to prevent flow from the pilot chamber into the clearance space between the piston and housing, said seal being U-shaped plastic having low friction and being fixed relative to the piston with the open part of the seal facing the pilot chamber,

a spring inside the seal forcing the outer lip of the seal outwardly and imposing frictional resistance to movement of the piston,

a filter screen between the inlet chamber and the bleed hole to keep foreign matter therefrom,

an inlet in said other end wall of the housing,

an outlet in the side wall of the housing,

the clearance between the piston and the housing from said housing outlet to said seal being exposed to said housing outlet only so there is not flow from the inlet chamber into the clearance,

a second spring acting on the piston to move it to a position in which it closes off the outlet when the pilot valve is closed and the chamber pressures are equalized but which is overcome by the pressure differential across the piston head when the pilot valve is opened by reason of pressure in the inlet chamber exceeding said predetermined value and causing the bellows to collapse,

said piston moving to uncover the outlet when the second spring has been overcome.

3,960,170

PRESSURE REGULATING VALVE

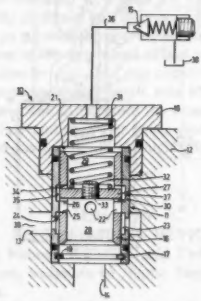
Werner Schuhmacher, Asperg, and Karl-Heinz Rothenstein, Hochdorf, both of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Mar. 18, 1975, Ser. No. 559,642

Claims priority, application Germany, Mar. 20, 1974, 2413273

Int. Cl.² G05D *16/00*

U.S. Cl. 137—491 **7 Claims**



1. A pressure regulating valve, comprising a main valve having a housing, a valve member slidable in said housing and defining at its opposite ends two pressure chambers, a high-pressure port and a low-pressure port of which one communicates with one of said chambers, a throttle connecting said chambers, and a spring acting in the other chamber upon one of said valve member and urging the same from a blocking position in which it interrupts communication between said ports towards a rest position in which it permits communication between said ports; a control valve having a fluid line communicating with the other of said chambers for selecting a mainvalve response pressure; first passage means connecting said ports with one another via said one chamber when said valve member approaches said rest position; and second passage means parallel to said throttle and connecting said chambers with one another when said valve member approaches said blocking position.

3,960,171

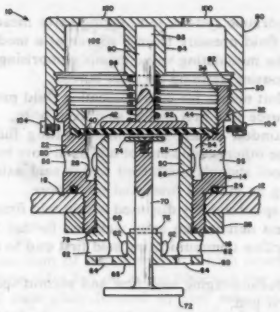
HELMET EXHAUST VALVE

Steven F. Segrest, and Josef M. Gardner, both of Panama City, Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 27, 1975, Ser. No. 544,467

Int. Cl.² F16K *17/06, 17/18*

U.S. Cl. 137—495 **3 Claims**



1. A diver's exhaust valve comprising:

a hollow valve body including stepped first, second, and third cylindrical wall portions, the respective inside diameters of which increase progressively from one end of said body to the other end thereof;

a tubular valve seat member fixed to said first wall portion and extending coaxially into said valve body in spaced concentric relation with said second wall portion so as to define therewith an annular space, said valve seat member presenting an annular valve seat lying in a transverse plane between said second and third wall portions;

a flexible, imperforate diaphragm lying in said plane and having its periphery fixed in sealed relation to said valve body, said diaphragm being adapted to move into and out of engagement with said annular valve seat;

a cup-shaped knob having an internally threaded side wall portion adjustably engaged with threads on said third cylindrical wall portion of said valve body;

a plunger having a head portion bearing against said diaphragm;

a compression spring disposed between said plunger head portion and said knob, and operative to urge said diaphragm toward said annular seat with a spring exerted biasing force selected by adjustment of said knob;

said knob including at least one port for admitting ambient water pressue to said diaphagm so as to urge said diaphragm toward said seat; and

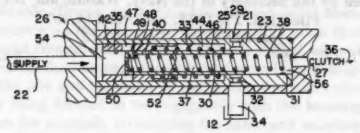
said second cylindrical wall portion having a plurality of radially extending ports communicating between said annular space and the exterior of said valve so that a portion of said diaphragm overlying said annular space is subjected to ambient water pressure acting in a direction away from said seat, whereby when exhaust gas pressure in said tubular valve member acts on said diaphragm with a force that exceeds said spring exerted biasing force, said diaphragm is moved from said seat to permit gas to pass between said seat and said diaphragm, through said annular space, and out said radially extending ports.

3,960,172

CARTRIDGE MODULATING VALVE

William W. Blake, Kewanee, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jan. 14, 1975, Ser. No. 541,038
Int. Cl.² F16K 31/122, 31/383
U.S. Cl. 137—504 6 Claims



1. In a hydraulic system, modulating valve means for communicating fluid pressure from a source at a modulated rate to a load, the modulating valve means comprising:

a valve housing defining an axial bore;

first conduit means for communicating fluid pressure from said source to a first end to said axial bore;

second conduit means for communicating fluid pressure from the other second end of said axial bore to said load;

a first spool slidably contained within said axial bore and defining an internal first axial spool bore;

a second spool slidably disposed within said first axial spool bore and defining an axial well and further defining an axial orifice communicating said first end to said second end;

resilient means urging said first and second spools toward said first end;

said first and second spools adapting a first relative position upon communication of fluid pressure to said first end, said first and second spools defining passage means associated with said first and second spools, said passage means for communicating fluid between said first end and said second end only while said first and second spools are in said first relative position;

means responsive to fluid pressure communicated to said second end to cooperate with said resilient means for providing said first and second spools adopt a second relative position upon a predetermined fluid pressure build up in said second end, said second relative position blocking said passage means and allowing communication of said fluid pressure from said first end to said second end only through said axial orifice.

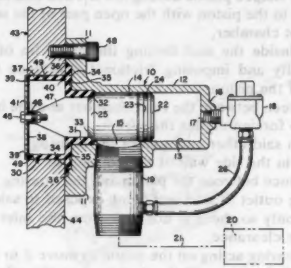
3,960,173

EXHAUST VALVE FOR A MOLD AND CORE BLOWING MACHINE

Fredrick Allen Bickers, Neponset, Ill., assignor to Martin Engineering Co., Neponset, Ill.

Filed Mar. 27, 1975, Ser. No. 562,432
Int. Cl.² B01D 35/02
U.S. Cl. 137—550 7 Claims

1. An exhaust valve for a molding machine apparatus adapted to be mounted on a wall of a sand magazine and to exhaust air under pressure from the magazine to atmosphere, said exhaust valve including a housing member having a central bore, a piston reciprocable in said bore, an exhaust port in communication with the central bore adapted to be closed off by said piston, a screen housing extending into said wall and having an annular piston seat projecting into said central bore of said housing member, a screen mounted in said screen housing, means to secure the assembled housing member and screen housing to said wall, and a fluid port in communication with said central bore at one side of said piston whereby said piston is actuated to move away from said seat and uncover said exhaust port, said screen housing being of larger size than said annular piston seat requiring an opening in said wall larger than the diameter of said central bore, said screen housing and annular piston seat being fabricated integrally and a flange on the screen housing clamped between said housing member and said wall by said securing means, said screen housing projecting through said wall into said magazine, and said screen is mounted in said screen housing in a position substantially coincident with a face of said wall.

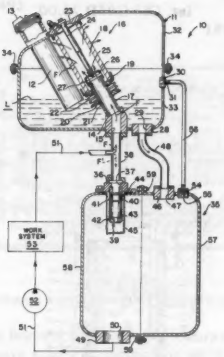


3,960,174

HYDRAULIC CIRCUIT WITH DUAL TANK SYSTEM AND METHOD FOR USING THE SAME

Eugene E. Latimer, Wilmington, and Larry W. Lorimor, Crest Hill, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Sept. 3, 1974, Ser. No. 502,826
Int. Cl.² E03B 7/07
U.S. Cl. 137—563 20 Claims



1. In a hydraulic circuit comprising a first tank and a second tank having an upper end thereof disposed at an elevation below said first tank the improvement comprising

first means communicating pressurized hydraulic fluid in closed communication from an outlet from said second tank, through a work system means for translating energy of said hydraulic fluid into mechanical energy and to an inlet to said first tank directly,

second means openly communicating an unobstructed flow of hydraulic fluid in closed communication from an outlet of said first tank to an inlet to said second tank to continuously maintain said second tank at its full capacity with said hydraulic fluid and

third means, including valve means disposed at another inlet to said second tank, for bypassing said first tank by communicating hydraulic fluid from said first means and into

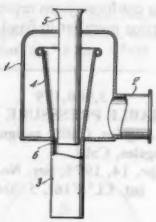
said second tank directly when the pressure level of hydraulic fluid at the inlet to said first tank exceeds a predetermined level.

3,960,175

INSTALLATION FOR CHARGING LIQUIDS, PARTICULARLY FERMENTATION LIQUIDS, WITH GAS

Friedrich Liepe; Gerhard Langhans, both of Dresden; Leonhard Jagusch, Leipzig; Klaus Richter, and Güenter Schlaf, both of Dresden, all of Germany, assignors to VEB Chemieanlagenbau und Montagekombinat Leipzig, Leipzig, Germany

Filed Aug. 16, 1974, Ser. No. 497,974
Int. Cl.² F16K *19/00*
U.S. Cl. 137—604 **9 Claims**



1. Pressure jet apparatus for charging a liquid with gas comprising a generally circular sectioned vessel disposed with its axis substantially vertical and having a top and bottom wall, a liquid inlet connection opening to said vessel adjacent the bottom wall thereof, a generally circular sectioned jet pipe leading downwardly from the bottom of the vessel for conducting liquid charged with gas from the vessel, an upwardly diverging, generally vertically disposed, conical insert secured to the upper end of said jet pipe and extending upwardly toward the top wall of said vessel, the lower end of said insert being of similar diameter to that of the upper end of said jet pipe, a vertically disposed gas inlet pipe arranged concentrically with said jet pipe and extending through the top wall and terminating close to the upper end of said jet pipe and defining there with an annular gap, that gap constituting means accelerating liquid passing therethrough, said jet pipe being free of diverging portions and the ratio of the cross sectional areas of said gas inlet pipe and said gap being directly related to the ratio of flows of gas and liquid through said pipe and said gap respectively.

3,960,176

FLUID LOADING DEVICE

Shigeru Chino; Nobuto Miyazaki, and Tadaya Takahashi, all of Ageo, Japan, assignors to Nigata Engineering Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 476,498, June 5, 1974, abandoned. This application June 3, 1975, Ser. No. 583,483
Claims priority, application Japan, June 6, 1973, 48-64087
Int. Cl.² B67D *5/00*
U.S. Cl. 137—615 **3 Claims**

1. In a fluid loading device of the type including a vertical hollow supporting member pivotably supporting at its upper end for rotation about a first horizontal axis, an inner hollow arm which in turn has pivotably supported at one end thereof, for rotation about a second horizontal axis, an outer hollow arm, the improvement comprising:

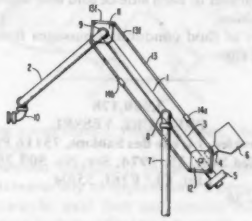
a first equilateral polygonal cam plate mounted to said outer hollow arm, for rotation about said second horizontal axis with said outer hollow arm;

a second similar equilateral polygonal cam plate mounted to said inner balancing arm for pivoting freely about a horizontal axis;

a balancing weight mounted to said second polygonal cam plate radially outward of its pivot axis and in a circumferential position related to the circumferential position of said outer hollow arm relative to said first polygonal cam plate;

a first plurality of linked rods trained about said first polygonal cam plate such that, in each instance, the point of connection of adjacent rods which overlie adjacent cam plate sides fall on a line bisecting the apex of said first cam plate formed by said adjacent cam plate sides, each of said first plurality of rods having a length equal to 1/n times the length of one side of the associated cam plate where n is an integer;

a second plurality of linked rods trained about said second polygonal cam plate such that, in each instance, the point



of connection of adjacent rods which overlie adjacent cam plate sides fall on a line bisecting the apex of said second cam plate formed by said adjacent cam plate sides, each of said second plurality of rods having a length equal to 1/n times the length of one side of the associated cam plate where n is an integer;

a single linked rod connecting the driven end of said first plurality of linked rods to the driving end of said second plurality of linked rods, said single linked rod being longer in length than the sides of said first and second cam plates; and

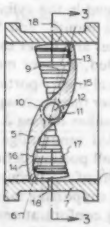
a single linked rod connecting the driven end of said second plurality of linked rods to the driving end of said first plurality of linked rods, said single linked rod being longer in length than the sides of said first and second cam plates.

3,960,177

LOW TORQUE AND LOW NOISE BUTTERFLY VALVE DISC

Hans D. Baumann, P.O. Box 92, Manville, R.I. 02838

Filed Mar. 12, 1975, Ser. No. 557,799
Int. Cl.² F16K *1/22, 47/04*
U.S. Cl. 137—625.31 **4 Claims**



1. A low torque and low noise butterfly valve disc comprising:

a. an oval shaped disc, the outer periphery being angularly off-set from the perpendicular axis of a straight, cylindrical bore of a butterfly valve and fitting closely within said

cylindrical bore when in the closed valve position, one side of said disc facing up-stream, the other to the down-stream side of said butterfly valve;

b. a central, perpendicular hub section straddling the shortest width of said oval shaped disc and containing within a bore to receive a supporting valve shaft;

c. a series of ribs protruding out of each side of said disc near the outer periphery of said disc and extending generally parallel to the longitudinal axis of said cylindrical bore of a butterfly valve, when viewed in the closed valve position, and forming two semi-circular rows, the protruding lenght of said ribs diminishing towards said hub section, one of said rows of ribs being located on the upstream side of said disc, while the other is located on the downstream side; said series of ribs forming substantial fluid impediments by extending into the path of fluid passing parallel to each side of said disc when in the open valve position;

d. a number of fluid conducting passages formed between adjoining ribs.

3,960,178

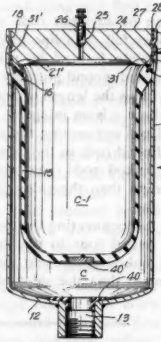
PRESSURE VESSEL

Jacques H. Mercier, 14, rue des Sablons, 75116 Paris, France

Filed Sept. 25, 1974, Ser. No. 509,251

Int. Cl.² F16L *55/04*

U.S. Cl. 138—30 **5 Claims**



1. In a pressure vessel comprising a container having a cylindrical wall portion having an inner surface, said cylindrical wall portion being closed at one end and defining a mouth at its other end, said closed end having a port, a deformable partition of resilient deformable material in said container having an annular rim for defining a first and a second fluid chamber, an annular supporting member having a cylindrical upper portion positioned in the cylindrical wall portion of the container adjacent its mouth, and having an annular lower portion having an inner and outer surface to which the rim of said partition is bonded, a cover member having a port and fixed in said cylindrical upper portion of said container with said supporting member therebetween, the improvement comprising said cover member having a cylindrical side wall portion having a rounded inner edge and having an annular groove in said side wall portion defining a locking conformation, said wall portion of said container and the cylindrical upper portion of said supporting member having complementary engaging locking conformations formed integrally therewith complementary to the locking conformation in said cover member and which coact therewith to retain said cover member and said supporting member in fixed position in said container with the lower edge of said supporting member projecting downwardly of the inner edge of said cover member, means for sealing said first and said second chamber relative to said cylindrical wall portion and said cover member, said sealing means comprising the rim of said partition including deformable layers covering at least a portion of said inner and outer surface of the annular lower portion of said supporting member, the outer surface of the lower portion of the supporting member being compressed against said inner surface of said cylindrical wall of the container, the inner rounded edge of the side wall of the cover member abutting against the layer on said inner surface of the annular lower portion of said supporting member and wherein said wall portion of the container adjacent its mouth is of enlarged diameter defining an annular shoulder, the outer surface of the layer of bladder material on the outer surface of the lower portion of the annular supporting member abutting against said annular shoulder, and said rounded inner edge of said cover and said annular shoulder cooperating to sealingly compress said annular rim of said deformable partition whereby said first fluid chamber and said second fluid chamber are sealed independently of the locking conformations retaining said cover member and said supporting member in fixed position in said container.

3,960,179

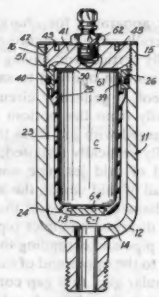
REPAIRABLE PRESSSURE VESSELS

Abduz Zahid, Los Angeles, Calif., assignor to Greer Hydraulics, Inc., Los Angeles, Calif.

Filed Apr. 14, 1975, Ser. No. 567,644

Int. Cl.² F16L *55/04*

U.S. Cl. 138—30 **4 Claims**



1. A pressure vessel comprising a rigid hollow container having a cylindrical opening at one end defining the mouth of the container and having a port at its other end, a bladder of resilient deformable material in said container, said bladder having a mouth at one end and being closed at its other end and intervening between said opening and said port, annular shoulder means in said container wall, an annular supporting member of rigid material contacting said shoulder means and having a cylindrical outer periphery with an annular groove therein and a bottom surface to which the mouth of the bladder is bonded, said annular shoulder means releasably supporting said annular supporting member, an O-ring positioned in said annular groove to define a seal with respect to the adjacent wall surface of the container, the mouth of said bladder having a portion at the outer end thereof bonded to and extending longitudinally outward from the top surface of said annular supporting member and defining an annular sealing portion, a cover member having a port, said cover member being positioned in the cylindrical opening of said container, said cover member having an inner surface with an annular groove positioned slightly inwardly from the outer periphery of said cover member, the portion of the inner surface of said cover member between its outer periphery and said annular groove defining an annular rim, means releasably to retain said cover member in fixed position in said cylindrical opening with the annular rim abutting against the portion

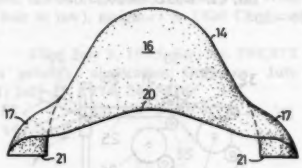
of the top surface of said annular supporting member outwardly of the sealing portion of the mouth of the bladder to retain said annular supporting member against said annular shoulder means, said sealing portion of said bladder being compressed between said supporting member and said cover member and accommodated in the annular groove in said cover member to define an annular seal, the entirety of said sealing portion of said bladder being located radially inwardly of said rim.

3,960,180

PROTECTION COVER FOR PIPE BENDS

Frans Gunnar Seved Andersson, Djarved, Sweden, assignor to Aktiebolaget M. Anderssons Isolering, Ornskoldsvik, Sweden

Filed Jan. 14, 1974, Ser. No. 433,302
Claims priority, application Sweden, Mar. 1, 1973, 7302888
Int. Cl.² F16L 57/00
U.S. Cl. 138—110 5 Claims



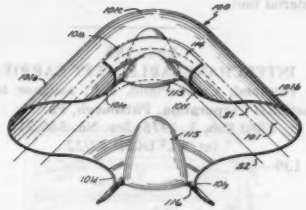
1. An elongate protection cover for pipe bends, each such pipe bend defining a curvature plane and having an exterior side and an interior side; said cover comprised of a deformable material that has been deep drawn into a shape which is similar to the shape which could be obtained if an integral and complete cover installed on a pipe bend had been cut along the interior generatrics line of the pipe bend and spread apart and opened up, said cover before being installed on a pipe bend having longitudinal and transverse planes of symmetry and comprising a cup-shaped portion elongated along said longitudinal plane of said cover and having long sides and short sides, said cup-shaped part being rounded in transverse cross-section; and a tail section located at each short side of said cup-shaped part, each said tail section having a concave bend therein such that when said cover is applied to a pipe bend with said longitudinal plane of said cover perpendicular to the curvature plane of the pipe bend, each said tail section can be folded at least to an edge line located along the interior generatrics line of the pipe bend; said cup-shaped part having a first curvature radius in the transverse direction determining the curvature of said cover, when applied to a pipe bend, on the exterior side of the pipe bend; and said cover further having, when applied to the pipe bend, a second curvature radius determining the curvature of the cover on the interior side of the pipe bend, said first and second radii respectively having first and second mutually different centers, said first center being located closer to the exterior side of the pipe bend than said second center, said second curvature radius being greater than said first curvature radius; said two tail sections, before said cover is applied over the pipe bend, having the free edges thereof in the same plane, said same plane being perpendicular to both said transverse and longitudinal planes of said cover, and the connecting edges connecting said two tail sections and defining the lower edges of said long sides of said cup-shaped part being curved upward and above said same plane.

3,960,181

ARTICLE FOR COVERING VARIOUS PIPEFITTINGS

Charles B. Baur, 7302 Ocean Front Walk, Newport Beach, Calif. 92660, and Roland P. Schultz, 2241 Raleigh St., Costa Mesa, Calif. 92627

Continuation-in-part of Ser. No. 143,464, May 14, 1971, abandoned. This application Oct. 15, 1973, Ser. No. 406,634
Int. Cl.² F16L 57/00
U.S. Cl. 138—178 4 Claims



1. An elbow cover formed from a flexible, thin-sheet structure, comprising:

first and second cylindrical surface sections, each conformed transversely to approximate a peripheral arc of a first semicircle, said first and second surface sections each further including first longitudinally extending joining edges formed on either side thereof;

a first toroidal arc section conformed radially to approximate said peripheral arc of said first semicircle connected between the adjacent transverse ends of said first and second cylindrical surface sections;

third, fourth, fifth and sixth cylindrical surface sections conformed transversely to approximate peripheral arc of a second semicircle, each said third, fourth, fifth and sixth surface sections including second longitudinal joining edges joined to the respective longitudinal joining edges of said first and second surface sections; and

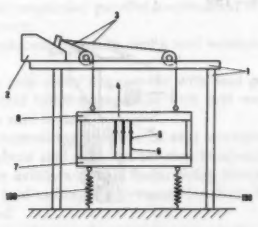
second and third toroidal oppositely disposed arc sections conformed radially to approximate the peripheral arc of said second semicircle, connected between the respective adjacent transverse ends of said third and fourth, and fifth and sixth surface sections and including an elliptic deformation formed over the central section thereof.

3,960,182

HEDDLES FOR WEAVING MACHINES HAVING HEDDLE FRAME BARS FOR SEVERAL HEDDLES, WHICH BARS ARE MOVED BY A SHED-FORMING DEVICE

Rudolf Schwarz, Horgen-Zurich, Switzerland, assignor to Staeubli, Ltd., Horgen-Zurich, Switzerland

Filed Apr. 7, 1975, Ser. No. 565,395
Claims priority, application Switzerland, Apr. 9, 1974, 4975/74
Int. Cl.² D03C 9/00, 9/02
U.S. Cl. 139—91 11 Claims



1. In a weaving machine having a heddle frame composed of at least vertically spaced upper and lower frame members

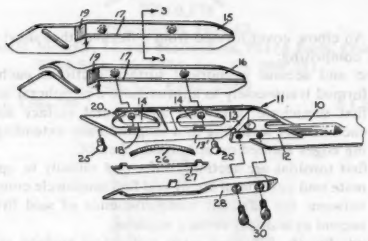
and a plurality of heddle means having eyelets therein extending between said upper and lower frame members, the improvement comprising wherein said heddle means consists of one single cord of flexible, practically nonelastic, nonmetallic material having a plurality of said eyelets formed therein and along the length thereof, said single cord being looped around at least said upper frame member a plurality of times with said eyelets being horizontally aligned and elastic band means secured to said nonelastic, nonmetallic material and engaging said lower frame member for keeping said nonelastic, nonmetallic material taut.

3,960,183

INTERCHANGEABLE WEFT CARRIER

Maurice Flamand, Cumberland, R.I., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Feb. 3, 1975, Ser. No. 546,215
Int. Cl.² D03D 47/22
U.S. Cl. 139—447 **2 Claims**



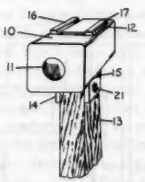
1. An improved carrier for inserting weft yarn into the shed formed between warp yarns on a loom of the type in which the weft yarn is supplied from a source located outside of the warp and is inserted into the shed by a carrier which is attached to a reciprocating inserter, said improved carrier comprising a main body portion including (a) a shank portion for attached to the inserter, (b) a generally horizonally extending upper wall and (c) at least one additional wall which extends substantially vertically, a weft yarn guiding backplate disposed adjacent said vertically extending wall of said main body portion, fastening means for securing said backplate to said vertically extending wall, and gripping means assembled on said main body portion for holding the end of the weft yarn being inserted.

3,960,184

LOOM PICKER RETAINER

Eugene N. Phillips, Hopedale, Mass., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Apr. 28, 1975, Ser. No. 572,060
Int. Cl.² D03D 49/36
U.S. Cl. 139—159 **1 Claim**



1. In combination with a picker stick of a loom and a loop picker carried thereon having a substantially rectangular opening defined by inner side walls and end walls of comparably shorter length than the inner side walls to receive the end of the picker stick, a picker retaining device comprising:

a. a plate-like retaining member interposed between each of the inner side walls of the picker and the adjoining surface of the picker stick, said plate-like retaining members including a portion which extends downwardly beyond the lowermost portion of the picker;

b. a laterally extending lip integrally formed on the upper end of each said plate-like retaining member and extending therefrom into engagement with the picker defining a vertical location of the picker on the picker stick; and

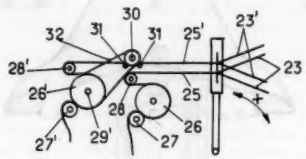
c. a pin member extending through the picker stick below the picker with the ends thereof connected to said plate-like retaining member for locking the latter at a preselected location on the picker stick so that the location of the picker cannot change during loom operation.

3,960,185

RIBBON WEAVING LOOM CONSTRUCTION

Erich Bühler, Eichsel, Germany, assignor to Jacob Muller, Frick, Switzerland

Filed Dec. 11, 1973, Ser. No. 422,941
Claims priority, application Switzerland, Dec. 11, 1972, 17988/72
Int. Cl.² D03D 49/20, 35/00
U.S. Cl. 139—307 **9 Claims**



1. In a ribbon-weaving loom, in which at least two ribbons are being woven simultaneously and from which the ribbons must be withdrawn in substantial parallelism, a combination comprising at least one withdrawing roller for each of said ribbons, and about which the respective ribbon is trained so that the roller is located beneath the ribbon, one of said withdrawing rollers being located at a level lower than the other withdrawing roller; a spacing roller for the ribbon on said other withdrawing roller, said spacing roller being located at a level above said one withdrawing roller; drive means for rotating the respective withdrawing rollers; and means for driving said spacing roller in rotation so that the density of weave of both of said ribbons is substantially identical.

3,960,186

WEFT YARN CONTROL DEVICE

Claude A. Wheeler, South Grafton, Mass., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Apr. 7, 1975, Ser. No. 565,539
Int. Cl.² D03D 47/34
U.S. Cl. 139—450 **1 Claim**

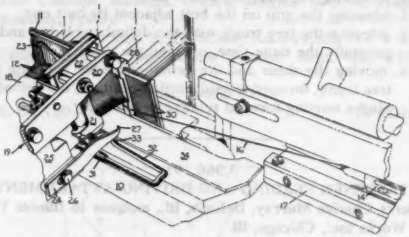
1. In a loom of the single pick insertion type having a reciprocating lay, a reed, and inserting and extending carrier by means of which weft yarn from an outside source is introduced into sheds formed by warp threads and a selvage forming device for inserting the ends of a pick into a warp shed after beat-up by the reed, a weft yarn control device comprising:

a. means carried by the reed for positioning that portion of a pick adjacent the warp forwardly of the reed during the latter's movement toward beat-up position;

b. means carried by the loom for receiving the pick from said positioning means and holding it in a location for reception by the selvage forming device; and

c. means defining a rod member operatively associated with said receiving means having a camming surface formed on one end thereof for engaging the weft and guiding the

same to a position on the upper surface of said rod member to effect its reception into the weft gripping portion



of the inserting carrier during movement of the reed away from beat-up position.

3,960,187

METHOD AND DEVICE FOR METERING AND DISPERSING FLUID MATERIALS

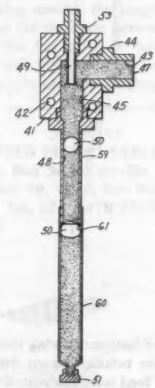
Heinz Stock, Oberursel, Germany, and Hans W. Rebentisch, deceased, late of Frankfurt, Germany (by Waltraud Rebentisch, heir at law), assignors to USM Corporation, Boston, Mass.

Filed July 9, 1975, Ser. No. 594,573

Claims priority, application Germany, July 23, 1974, 2435431; July 23, 1974, 2435410

Int. Cl.² B65B *3/26*

U.S. Cl. 141—1 R **16 Claims**



1. A method of metering and dispensing fluids which comprises progressing at a substantially constant rate a column of the fluid through a tube, injecting at timed intervals successive portions of gas seriatim into successive portions of said column of fluid to form bubbles spaced along the length of said columm so that fluid flows from an outlet opening of the tube as separated portions of uniform magnitude determined by said rate and said intervals.

10. A device for metering and dispensing fluids comprising a tube through which a fluid is progressed, an outlet at the end of the tube through which the fluid may be dispensed, means for progressing a column of fluid through the tube to establish a substantially constant rate of flow to the outlet and means for injecting at timed intervals successive portions of gas into the tube to form bubbles spaced along the length of said column to separate the fluid dispensed from the outlet of the tube into metered portions determined by said rate and said intervals.

3,960,188

PROGRAMMED CONTOUR COPYING MACHINE

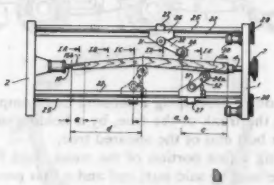
Erich Schmidt, Mauerbach, Austria, assignor to Maschinenfabrik Zuckermann Komm. Ges. Wien, Vienna, Austria

Filed Dec. 19, 1974, Ser. No. 534,276

Claims priority, application Austria, Dec. 19, 1973, 10649/73

Int. Cl.² B23B *3/28*; B27C *5/00*

U.S. Cl. 142—7 **10 Claims**



1. A method of reproducing in an elongated workpiece the contours of an elongated pattern having at least one substantially planar and longitudinally extending surface, said method comprising the steps of:

suspending said workpiece and said pattern rotatably about respective parallel longitudinal workpiece and pattern axes;

continuously urging a feeler into engagement with said pattern and urging a shaping tool linked to said feeler into engagement with said workpiece;

restraining said workpiece and said pattern from rotation temporarily while displacing said feeler longitudinally along said surface to cut into said workpiece with said tool a facet similar to said surface; and

synchronously rotating said workpiece and said pattern while displacing said feeler and said tool along said pattern and said workpiece to cut the remainder of the contours of said pattern into said workpiece, said workpiece and said pattern being restrained from rotating at predetermined angular positions each corresponding to a respective planar surface of said pattern.

8. An apparatus for shaping an elongated workpiece, said apparatus comprising:

an elongated pattern having at least one substantially planar and longitudinally extending surface;

means for suspending said workpiece and said pattern rotatably about respective parallel longitudinal workpiece and pattern axes;

a slider displaceable axially along said workpiece and said pattern;

a feeler on said slider engageable with said pattern and a tool on said slider engageable with said workpiece and linked to said feeler;

means for restraining rotation of said workpiece and said pattern about said axes and for simultaneously displacing said slider axially with said feeler riding along said surface and said tool cutting a corresponding facet in said workpiece; and

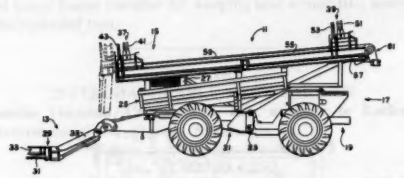
means for synchronously rotating said workpiece and said pattern to cut the remainder of the contours of said pattern into said workpiece with said tool.

3,960,189

METHOD FOR PROCESSING TREES AND APPARATUS USED THEREIN

Robert N. Windsor, Brisbane, Australia, and Stanley C. Jasinski, Woodstock, Canada, assignors to Eaton Yale Ltd., Canada

Filed Mar. 20, 1975, Ser. No. 560,662
Int. Cl.² A01G 23/08
U.S. Cl. 144—3 D 7 Claims



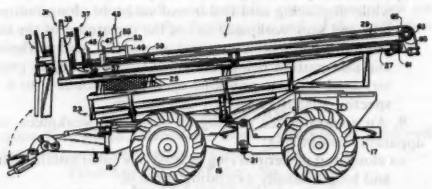
1. A method of processing a sheared tree comprising:
a. holding the trunk of the tree, by a holding means, adjacent the butt end of the sheared tree;
b. delimbing a first portion of the trunk, said first portion being defined by said butt end and a first predetermined point along the trunk of the tree;
c. gripping the tree trunk at a gripping point intermediate said butt end and said first predetermined point;
d. releasing the hold on the trunk adjacent said butt end;
e. severing a first bolt defined generally by said butt end and said gripping point;
f. subsequent to step (e), moving the tree trunk minus said first bolt relative to and past a set of delimbing blades in a direction towards said holding means to delimb a second portion of the trunk; and
g. severing a second bolt.

3,960,190

METHOD AND APPARATUS FOR HARVESTING SHEARED TREES

John Gerald Smith, Woodstock, Canada, assignor to Eaton Yale Ltd., Canada

Filed June 4, 1975, Ser. No. 583,734
Int. Cl.² A01G 23/08
U.S. Cl. 144—3 D 11 Claims



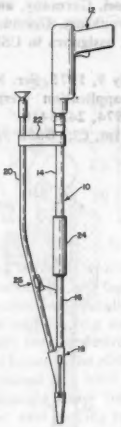
1. A method of processing a sheared tree utilizing a processing apparatus including a gripping means adjacent the forward end of the apparatus, delimber blades and a shear, the method comprising:
a. gripping the trunk of the tree adjacent its butt end to maintain the tree trunk longitudinally fixed relative to the apparatus;
b. positioning the delimber blades and the shear at a starting position with the delimber blades at a distance X rearward of the gripping means, the shear being disposed adjacent the delimber blades and between the gripping means and the delimber blades;
c. moving the shear and the delimber blades rearward a predetermined distance to delimb a portion of the tree trunk;
d. moving the delimber blades a distance Y rearward of the shear, the distance Y being at least equal to the distance X;
e. actuating the shear to sever a bolt;
f. releasing the grip on the bolt adjacent its butt end;
g. gripping the tree trunk with the delimber blades, and at generally the same time, opening the shear;
h. moving the shear and the delimber blades, gripping the tree trunk, forward to said starting position, the delimber blades moving forward relative to the shear.

3,960,191

FASTENER FEEDING AND DRIVING ATTACHMENT

Pierre Charles Murray, DeKalb, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed June 17, 1975, Ser. No. 587,796
Int. Cl.² B27B 17/00
U.S. Cl. 144—32 R 11 Claims

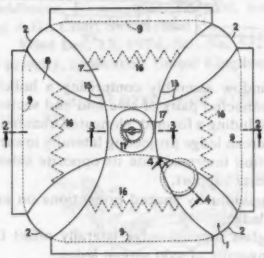


1. A portable power fastener driving tool including a driving spindle located within tubular means for axial and rotative movement therein, a feed tube associated with and connected to the tubular means for supplying fasteners to be driven by the spindle, a nose portion adapted to abut a workpiece and including a Y connection including a pair of upper arm sections and merging to a common bore section for coupling the tubular means to the feed tube at the lowermost extremity of the tool, the tubular means including an upper tube member coupled to suitable power supply means and a lower tube member at one of the said upper arm sections of the nose portion, the upper and lower tube members being mounted for relative reciprocating telescopic movement, spring means associated with the tubular means to bias the spindle and upper tube element upwardly from the Y connection, the upper tube element including a cam of predetermined axial dimension fixedly mounted thereon, a two position, pivotable escapement device mounted on the feed tube including means for selective activation to one of the two positions by the cam so that the spindle may be moved downwardly to an operative position within the nosepiece while the escapement controls the feeding of fasteners thereto.

3,960,192
TANK CAPABLE OF BEING CARRIED BY A HELICOPTER

Michel Convain, Bondues, France, assignor to S. A. Pronal, Roubaix, France

Filed Sept. 5, 1975, Ser. No. 610,855
Claims priority, application France, Sept. 26, 1974, 74.32461
Int. Cl.² B65D 33/14
U.S. Cl. 150—1 10 Claims

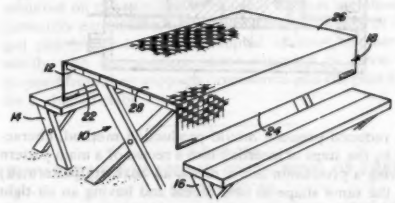


1. A tank for being suspended from a helicopter and comprising a bag which has a flexible wall and has in plan in a flat condition substantially the shape of a regular polygon, suspension means for the bag, the suspension means being constituted by straps which cross in a region and are fixed by their respective ends to two opposed edges of the bag and are interconnected in the crossing region of the straps where there is provided a hooking means, the length of the straps being slightly greater than the distance between the corresponding opposed edges in the flat state of the bag and each strap widening from the crossing region so that the two straps when viewed in plan have substantially the shape of a Maltese Cross.

3,960,193
WEIGHTED PICNIC TABLE CLOTH

Lyle W. Davis, P.O. Box 347, Kerrville, Tex. 78028

Filed Mar. 10, 1975, Ser. No. 556,863
Int. Cl.² A47B 97/00
U.S. Cl. 150—52 R 1 Claim



1. A table cloth for use over an elongated generally rectangular table top, said cloth comprising a rectangular flexible panel including opposite side and end marginal edge portions, said side marginal edge portions each including weight members supported from the opposite ends thereof, whereby said marginal edge portions, when hanging downwardly from corresponding edge portions of a table over which said panel is draped, will resist shifting of said panel relative to said table and lifting of said marginal portions of said panel from which said weight members are supported, said side marginal edge portions of said panel from which said weight members are supported including elongated hem portions extending longitudinally thereof, said weight members being enclosed within the opposite ends of said hem portions, said weight members comprising closed ended elongated flexible tubular members having heavy fluent material enclosed therein and extending longitudinally of the corresponding hem portion, said hem portions being closed on opposite sides of each of said weight members, each of said hem portions being free of weight members intermediate the weight members disposed in the opposite ends thereof.

3,960,194
BALANCED THREE-PLY BIAS TIRE

Patrick S. Neale, Mogadore, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

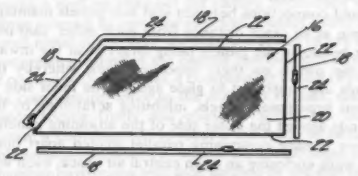
Filed June 30, 1975, Ser. No. 591,373
Int. Cl.² B60C 9/10
U.S. Cl. 152—355 5 Claims

1. A pneumatic tire comprising a ground-contacting tread portion, a pair of sidewalls extending radially inwardly of the axially outer edges of said tread portion and terminating at their radially inner extremities in a pair of annular inextensible bead portions and having a carcass reinforcing structure of continuous cords extending from one bead portion to the other bead portion, said reinforcing carcass structure consisting of three plies of bias tire cord fabric extending at an angle of between 25° and 40° with respect to the centerplane of the tire at the centerplane, said three plies being characterized by two of said plies being comprised of cords of a first denier and extending in the same general direction with respect to said centerplane and a third ply of said three plies being sandwiched between said first two mentioned plies and having cords of substantially greater denier than that of the first two plies and extending in an opposite direction with respect to said centerplane.

3,960,195
VENTILATED SCREEN FOR MOTOR VEHICLE PASSENGER COMPARTMENT WINDOW OPENINGS

Clandes B. Marchbanks, 52 Karen, Pontiac, Mich. 48055

Filed Dec. 13, 1973, Ser. No. 424,195
Int. Cl.² A47G 5/00; A47H 1/00
U.S. Cl. 160—105 1 Claim



1. A ventilation screen removably installed in a window opening of a passenger compartment of a motor vehicle, comprising:

a reticulated member having a peripheral shape generally corresponding to the shape of the window opening;

one chain of a slide fastener connected to the periphery of said reticulated member; and,

a mating chain of the slide fastener inserted between a weather strip immediately bordering the window opening and a motor vehicle body structure defining the window opening which weather strip and body structure being disposed toward the interior of the passenger compartment relative to a passenger compartment window which opens and closes in the window opening, said chain inserted between the weather strip and body structure engaging said chain connected to said reticulated member thereby removably fastening said reticulated member across the window opening on the interior side of the passenger compartment relative to the window so that the window can be opened and closed when said reticulated member is fastened across the window opening, and so said reticulated member can be removed from the window opening when the window is closed.

3,960,196

DOOR CLOSURE

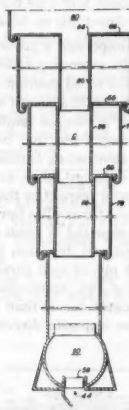
Erling Berner, Loretohohe 5, CH-6300, Zug, Switzerland

Division of Ser. No. 339,774, March 14, 1973, Continuation-in-part of Ser. No. 241,925, April 7, 1972, Pat. No. 3,886,851.

This application May 13, 1974, Ser. No. 469,229

Int. Cl.² E06B *3/12, 9/00*

U.S. Cl. 160—222 **9 Claims**



1. A telescopic door with spaced apart wall sections consisting of a series of equal parallel side panels, each panel being bent outward on the upper edge and inward in the opposing lower edge in such a way that each side panel easily can be caught by a superposed panel and in turn can catch the next adjoining lower panel when the door is being closed, and forming fixed connections between said side panels maintaining the same at an exact distance from each other, said outward edge bends on the panels being larger than the inward bends of the panels on their opposite edges, whereby the larger bends are supported to glide against the inner side of the adjacent superposed panels, inhibiting scratching by the inward bends against the outer side of the adjoining panels.

4. A door closure comprising parallel spaced apart inner and outer walls enclosing an open central air space, each wall being formed of a vertical tier of parallel horizontal panels separably secured edge to edge to be telescopically nestable, one beside the next in an upper plenum chamber, means for raising each wall section for telescopic storage of separated panels within said plenum and lowering as a door closure edge to edge assembly of said panels into parallel walls while maintaining said open central air space.

3,960,197

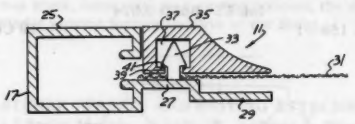
SCREEN AND STORM SASH CONSTRUCTION

Phillip D. Daniels, 40200 Grand River Ave., Novi, Mich. 48050

Filed Nov. 8, 1974, Ser. No. 522,027

Int. Cl.² A47G *5/00*

U.S. Cl. 160—371 **2 Claims**



1. A storm window assembly comprising a hollow frame including interconnected pairs of side and end sections;

said sections including a formed, elongated channel portion,

a continuous screen ledge projecting laterally inward of said channel portion intermedidate its opposite sides providing a peripheral support;

a series of longitudinally spaced projections on and along said screen ledge;

a continuous glass support ledge laterally offset from and projecting inwardly of said screen ledge;

a rectangular glass within said frame spanning and overlying said glass support ledge; and

a removable trim strip of channel form overlying said screen ledge and glass support ledge retainingly engaging said projections and overlying and retainingly engaging peripheral portions of said glass.

3,960,198

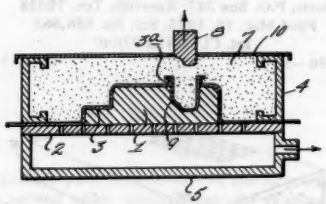
REDUCED PRESSURE MOULD PRODUCTION METHOD

Hiroshi Matsuura; Kazuo Ishimoto, and Takashi Yasukuni, all of Mihara, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 25, 1975, Ser. No. 571,558

Int. Cl.² B22D *7/04, 9/02*

U.S. Cl. 164—7 **1 Claim**



1. A reduced pressure mould production method, characterized by the steps of inserting into a recess of a main pattern (1) having a protrusion and a recess an auxiliary pattern (8) having the same shape as said recess and having an air-tight film (9) tightly adhered on its outer peripheral surface, thereafter placing said main pattern (1) fixedly on a surface plate (2) provided with evacuating means, covering the surface of the main pattern (1) including the upper surface of said surface plate but excluding the upper surface of said auxiliary pattern (8) with an air-tight film (3), then tightly adhering said air-tight film (3) onto the surface of the main pattern (1) excluding the upper surface of said auxiliary pattern (8) and onto the upper surface of the surface plate (2) with the evacuating means of the surface plate (2), thereafter extracting said auxiliary pattern (8) from the main pattern (1), subsequently placing a casting frame (4) provided with pressure reduction means on the surface plate (2), thereafter filling said casting frame (4) with solid particles (7), further covering the entire top surface of said casting frame (4) and the solid particles (7)

with an air-tight film (10), thereafter adhering said air-tight films (3) and (9) onto the side of the solid particles (7) by reducing the pressure within said casting frame (4) with said pressure reduction means and by recovering an atmospheric pressure within the surface plate (2), and then separating the main pattern (1) as well as the surface plate (2) from the casting frame (4).

3,960,199

EXPANSIBLE FRAME HOT TOPPING APPARATUS WITH WEDGE INSERTION MEANS

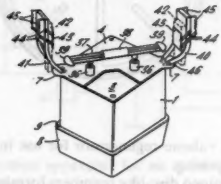
Roger Fieldhouse, Birmingham, England, assignor to Foseco Trading A.G., Chur, Switzerland

Filed Dec. 13, 1974, Ser. No. 532,690

Claims priority, application United Kingdom, Dec. 21, 1973, 59555/73

Int. Cl.² B22D *33/00, 45/00*

U.S. Cl. 164—339 **7 Claims**



1. In an apparatus for applying a hot top lining in an ingot mould or ingot mould head box which comprises a pair of slab support members each having two faces adapted to support an L-shaped slab of hot top lining material such that the L-shaped slabs are supported outside the members in the form of a rectangle, means for moving the members towards one another and apart to decrease or increase the size of the rectangle, supports for corner wedges located above the gap between supported L-shaped slabs when the members are in their most separated position, and means for applying pressure to the tops of the corner wedges to urge them into the gaps between the L-shaped slabs, the improvement which comprises said corner wedge supports being mounted on two opposed corners of one of the slab support members, means for releasing a corner wedge held in a said corner wedge support to allow it to drop with gravity, and providing, mounted on the said one of the slab support members, a bar outwardly extendable, pressure plates on the ends of the bar, and piston/cylinder means adapted to draw the bar downwardly with the pressure plates extended to force wedges dropped from their supports downwards into the gaps between the L-shaped slabs.

3,960,200

APPARATUS FOR LIQUID QUENCHING OF FREE JET SPUN METAL

Sheldon Kavesh, Whippany, N.J., assignor to Allied Chemical Corporation, New York, N.Y.

Division of Ser. No. 306,472, Nov. 14, 1972, Pat. No. 3,845,805. This application Aug. 21, 1974, Ser. No. 499,386

Int. Cl.² B22D *11/12*

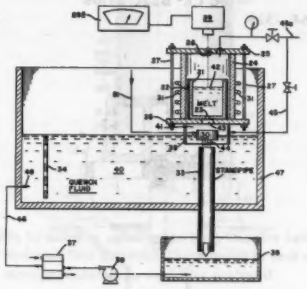
U.S. Cl. 164—281 **6 Claims**

1. An apparatus for the production of filament from a melt of normally solid material comprising:

a. a melting chamber adapted to receive said material, said chamber including means to melt said material and means to control the environment therein;

b. an extrusion orifice in the bottom of said melting chamber, adapted for extruding a filament of molten material;

c. an interface chamber below said orifice through which said filament is adapted to pass, said interface chamber including means for providing an evacuated space or controlled gaseous atmosphere therein; and



d. reservoir disposed below said interface chamber into which filament is adapted to be introduced, said reservoir comprising a liquid quenching medium adapted to move cocurrently with the molten filament introduced therein.

3,960,201

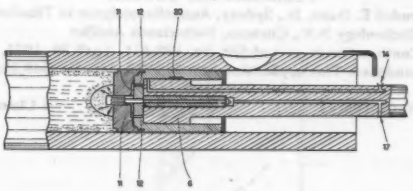
INJECTION DEVICE FOR MOLDING MACHINES

Robert Portalier, Ville d'Avray, France, assignor to Societe de Vente de l'Aluminium Pechiney, Paris, France

Filed Dec. 13, 1974, Ser. No. 532,641

Int. Cl.² B22D *17/30*

U.S. Cl. 164—312 **4 Claims**



1. An improved injection device for pressurized machines having a cooling chamber for casting nonferrous metals and alloys adapted to cause an effective counter effect on the still liquid metal comprising, an injection piston (6) to receive the compression effort of the casting machine but remaining out of contact with the metal, a compressing piston (5) to transmit the compression force to the metal to be cast, said injection piston sliding freely and coaxially within the compressing piston, a container (3) to receive the metal to be cast, a variable volume chamber (7) within the compressing piston, said chamber having one wall face defined by the end of the injection piston adapted to receive a gas which is inert with respect to the metal to be cast, an orifice in said compressing piston allowing communication between said chamber and said container, and a stop pin coaxial with said injection piston and received within said orifice to normally block gas flow through said orifice.

3,960,202

FOUNDRY EQUIPMENT

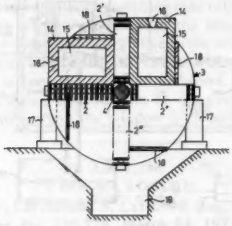
Hemming Kristian Jorgensen, Klampenborg, Denmark, assignor to Dansk Industri Syndikat A/S, Herlev, Denmark

Filed June 11, 1974, Ser. No. 478,254

Claims priority, application Denmark, June 19, 1973, 3383/73

Int. Cl.² B22C 17/08

U.S. Cl. 164—325 3 Claims



1. In a casting apparatus handling casting molds consisting of a plurality of uniform mold parts which are piled closely together to form a horizontal series presenting at least one casting cavity at each joint between successive mold parts, the improvement comprising: a frame that is journalled for rotation around a horizontal axis and includes at least two rigidly interconnected mold supports extending parallel to said axis and regularly angularly spaced around the same, means to stepwise and unidirectionally rotate said frame so as to tiltably move each of said mold supports successively through a substantially horizontal mold receiving position, a substantially vertical pouring position, and a mold discharge position, and means to hold a mold firmly against each of said supports during the tilting thereof until said mold discharge position has been reached.

3,960,203

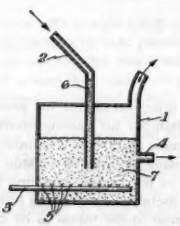
FLUIDIZED BED COOLER

Wendell E. Dunn, Jr., Sydney, Australia, assignor to Titanium Technology N.V., Curacao, Netherlands Antilles

Continuation-in-part of Ser. No. 138,461, April 29, 1971, abandoned. This application Apr. 9, 1973, Ser. No. 349,255

Int. Cl.² F28D 13/00

U.S. Cl. 165—1 5 Claims



1. A process for cooling to a temperature of 200°C., a fluidized bed of finely divided partially beneficiated titaniferous ore heated to a temperature in the range of 350° to 1100°C., in a gas-solids reactor, comprising (a) injecting into the bed of ore a stream of liquid having a boiling point at least 100°C. below the temperature of the bed of ore whereby volatilization of the stream of liquid maintains the bed of ore in a fluidized state and (b) removing said volatilized liquid from the gas-solids reactor.

3,960,204

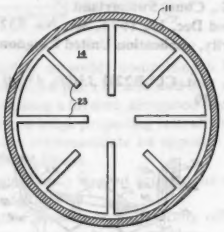
LOW VOID VOLUME REGENERATOR FOR VUILLEUMIER CRYOGENIC COOLER

Stuart B. Horn, Fairfax, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Division of Ser. No. 253,742, May 16, 1972, abandoned. This application Feb. 12, 1974, Ser. No. 441,914

Int. Cl.² F28D 17/00

U.S. Cl. 165—4 7 Claims



1. A low void volume regenerator for use in a Vuilleumier cooler and comprising:

a plurality of joined disc-like members forming an elongated body;

said disc-like members being made of heat insulating and heat conducting materials and being arranged to promote heat conduction radially of the regenerator body and to inhibit heat conduction longitudinally of the regenerator body; and

a plurality of substantially radial slots in said regenerator body providing a low void volume for the passage of gas longitudinally therethrough.

3,960,205

STORAGE BODY WITH LATENT STORAGE SUBSTANCES FOR TEMPERATURE EQUILIZATION

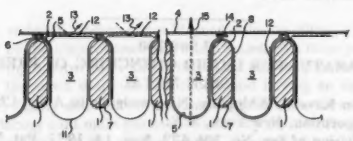
Nikolaus Laing, Hofener Weg 35 bis 37, 7141 Aldingen near Stuttgart, Germany

Filed Feb. 21, 1973, Ser. No. 334,445

Claims priority, application Germany, Feb. 24, 1972, 2208712

Int. Cl.² F24J 3/02

U.S. Cl. 165—48 9 Claims

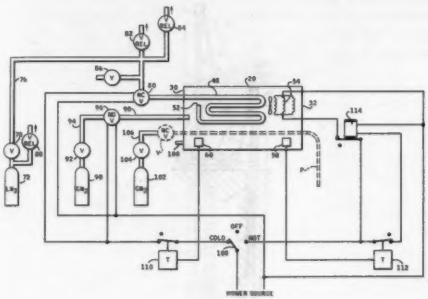


1. Wall structure for reducing temperature change within a building where said structure has optical transparent regions and control devices for controlling transmission of heat waves through the optical transparent regions, the improvement comprising having in addition foil hoses forming chambers which are sealed from each other at short intervals and a crystalline heat storage substance in said chambers having a melting temperature which is closer to the mean inside temperature to be maintained within a building than the mean ambient temperature outside the building.

3,960,206
REFRIGERATED HOPPER EQUIPMENT FOR AUTOMATIC RIVETING MACHINES

George I. Baxter; Clarence P. Rolla, both of San Diego, and Charles L. Holland, Escondido, all of Calif., assignors to General Dynamics Corporation, San Diego, Calif.

Continuation of Ser. No. 461,827, April 18, 1974, which is a division of Ser. No. 277,438, Aug. 2, 1972, Pat. No. 3,837,176.
This application Jan. 2, 1975, Ser. No. 538,058
Int. Cl.[2] F25B 29/00
U.S. Cl. 165—61 3 Claims



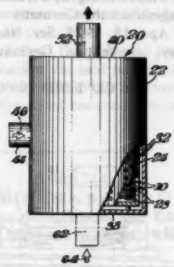
1. A refrigeration apparatus for an automatic riveting machine comprising:
- at least one hopper adapted to store and dispense rivets;
- an insulated enclosure in which said hoppers are mounted;
- refrigeration coils mounted in said enclosure;
- said coils connected to a supply source of a vaporizable liquid refrigerant;
- said coils having an opening for discharging said refrigerant into said enclosure in its dry gaseous state;
- a vent in said enclosure to vent said gaseous refrigerant to the exterior thereof;
- means to conduct a moisture inhibiting gas into said enclosure;
- a normally closed valve between said source of vaporizable liquid refrigerant and said enclosure;
- a normally open valve between the source of moisture inhibiting gas and said enclosure;
- means to open and close said normally closed valve concurrently with the closing and opening, respectively, of said normally open valve; and
- a heater positioned within said enclosure for rapidly increasing the temperature of said hoppers for servicing thereof;
- said normally closed valve being closed and said normally open valve being open during operation of said heater.

3,960,207
HEAT EXCHANGE APPARATUS

Karl W. Boer, R.D. No. 3, Kennett Square, Pa. 19348

Filed Nov. 28, 1973, Ser. No. 419,799
Int. Cl.[2] F28D 21/00
U.S. Cl. 165—104 R 15 Claims

1. Heat exchange apparatus comprising in combination:
- a plurality of ring-like, disc-shaped closed containers each adapted to hold a first material, said containers being disposed in a stacked array with each container being spaced from an adjacent container, to form a first passageway between adjacent containers,
- the center portion of each said ring-like container defining a conduit generally perpendicular to the plane of the disc in conduit relationship with said first passageway to form thereby a continuous passage of a fluid through said apparatus, and in conduit relationship with each of the other said perpendicular conduits in said other discs to form a second passageway therewith and with each said first passageway, and
- bonnet means for directing said fluid radially and inwardly through said passageways and then out of said apparatus,

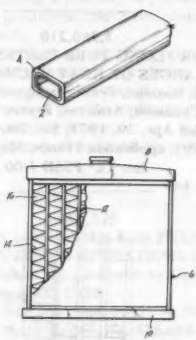


thereby to achieve an efficient heat transfer between said fluid and said first material, there being in said containers heat storage material as said first material.

3,960,208
PROCESS FOR PROVIDING HEAT TRANSFER WITH RESISTANCE TO EROSION-CORROSION IN AQUEOUS ENVIRONMENT

William H. Anthony, and James M. Popplewell, both of Guilford, Conn., assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Division of Ser. No. 439,335, Feb. 4, 1974, Pat. No. 3,872,921, which is a division of Ser. No. 222,795, Feb. 2, 1972, Pat. No. 3,809,155. This application Dec. 13, 1974, Ser. No. 532,335
Int. Cl.[2] F28F 19/06, 21/08
U.S. Cl. 165—1 8 Claims



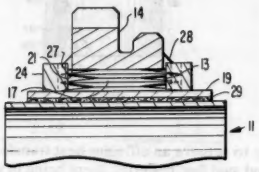
1. A process for providing heat transfer with resistance to erosion corrosion in an aqueous environment which comprises:
- A. providing metal tubing comprising an aluminum base alloy cladding consisting essentially of 0.8 to 1.3% zinc, 0.7% maximum silicon plus iron, 0.10% maximum copper, 0.10% maximum manganese, 0.10% maximum magnesium, balance essentially aluminum bonded to at least one side of an aluminum base alloy core consisting essentially of manganese from 1.0 to 1.5%, chromium from 0.1 to 0.4%, copper from 0.05 to 0.4%, balance essentially aluminum, said metal tubing having entrance and exits ends having a wall thickness no larger than 0.1 inch;
- B. affixing the said entrance and exit ends to two tube sheets;
- C. passing a first aqueous liquid through the tubing;
- D. contacting the external surface of said tubing with a fluid in heat exchange relationship with said fluid.

3,960,209

REGENERATIVE HEAT EXCHANGER OF A GAS TURBINE

Franz Neubrand, Unterwitzingen, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany

Filed Apr. 18, 1975, Ser. No. 569,294
Claims priority, application Germany, Apr. 22, 1974, 2419376
Int. Cl.² F28D 19/00
U.S. Cl. 165—8 7 Claims



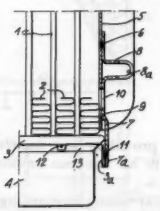
1. A regenerative heat-exchanger of a gas turbine, comprising a ceramic heat-exchanger disk, a metallic toothed rim substantially coaxially surrounding the heat-exchanger disk while forming an annular space, spring means arranged within the annular space which are supported under prestress, on the one hand, at entrainment plate means abutting at the circumference of the heat-exchanger disk and, on the other, against the inside of the toothed rim, characterized in that the spring means are formed by spring packets of cup springs which are guided on both sides in concave recess means provided in two webs arranged in the circumferential direction on the entrainment plate means, said webs surrounding the lateral surfaces of the toothed rim and being non-rotatably connected therewith.

3,960,210

DEVICE FOR FIXING TUBE PLATES AND LATERAL FLANGES OF HEAT EXCHANGERS

André Chartet, Meudon, France, assignor to Societe Anonyme des Usines Chausson, Asnieres, France

Filed Apr. 30, 1973, Ser. No. 355,438
Claims priority, application France, May 4, 1972, 72.15961
Int. Cl.² F28D 1/00
U.S. Cl. 165—149 11 Claims



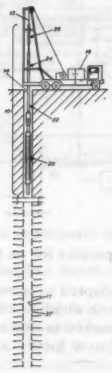
1. A heat exchanger core comprising a plurality of spaced substantially parallel tubes, two tube plates respectively secured to opposite ends of said tubes, and lateral flanges for mutual connection of said tube plates, said lateral flanges having movable end portions connected therewith through distortable substantially U-shaped members having a plurality of cuts extending longitudinally therethrough, said movable end portions being rigidly connected to said tube plates whereby said distortable members compensate through distortion thereof for differential heat expansion occurring between said tubes and said lateral flanges during brazing.

3,960,211

GAS OPERATED HYDRAULICALLY ACTUATED WIRE LINE PACKER

Stanley O. Hutchison, Bakersfield, and Neal L. Mitchell, Taft, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Sept. 30, 1974, Ser. No. 510,264
Int. Cl.² E21B 33/127, 23/04
U.S. Cl. 166—187 10 Claims



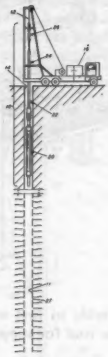
1. A wire line inflatable packer comprising an elongated body including a tubing section; means for connecting a wire line to the upper end of said elongated body; an elongated resilient sleeve positioned over at least a portion of said tubing section; means connecting the ends of said resilient sleeve in fluid-tight relationship with said tubing section to form an annular chamber between said tubing section and said resilient sleeve; port means providing a passageway for flowing fluid to said annular chamber; gas chamber means for storing high pressure gas in said elongated body for use in inflating said resilient sleeve; pressure sink means forming a pressure sink for use in deflating said resilient sleeve; conduit means connected between said gas chamber means and said port means and between said port means and said pressure sink means for use in inflating and deflating said sleeve; valve means connected to said conduit means for selectively controlling flow of high pressure gas between said port means and said gas chamber means through said conduit means to inflate said resilient sleeve and between said port means and said pressure sink means through said conduit means to deflate said resilient sleeve; and sequencing timer actuating means connected to said valve means for sequentially operating said valve means after passage of a predeterminable time interval to first inflate said resilient sleeve and then after passage of a second predeterminable time interval to deflate said resilient sleeve, said sequencing timer actuating means comprising means defining an orifice, a supply of noncompressible liquid for flow through said orifice, operating gas means for driving said liquid through said orifice and operating means responsive to liquid driven through said orifice for operating said valve means.

3,960,212

METHOD OF OBTAINING IMPRESSION INFORMATION FROM A WELL

Stanley O. Hutchison, Bakersfield, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 510,265, Sept. 30, 1974. This application May 8, 1975, Ser. No. 575,751
Int. Cl.² E21B 47/00, 47/10
U.S. Cl. 166—250 1 Claim



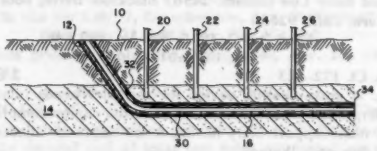
1. The method of obtaining impression information from a well comprising activating at the earth's surface a sequencing timer means contained in a wire line packer for inflating and deflating said packer, running into a well said wire line packer having an impression sleeve connected to the outside of an inflatable sleeve of said packer, lowering said inflatable packer down said well before the elapse of a predetermined time to position the impression sleeve at a predetermined depth in said well, automatically inflating said inflatable sleeve of said packer in response to said sequencing timer means to press said impression sleeve against the wall of said well, maintaining said inflatable sleeve in inflated condition for a predetermined time, then automatically deflating the inflatable sleeve of said packer in response to said sequencing timer means to remove said impression sleeve from said well wall, and removing said inflatable packer from said well.

3,960,213

PRODUCTION OF BITUMEN BY STEAM INJECTION

John Howard Striegler, Richardson, and Eddie Paul Howell, Plano, both of Tex., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed June 6, 1975, Ser. No. 584,516
Int. Cl.² E21B 43/24
U.S. Cl. 166—272 6 Claims



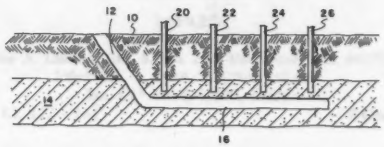
1. Method of recovering bitumen from a subterranean tar sand formation containing bitumen which comprises:
drilling an injection well to said formation and extending same into said formation;
inserting a perforated liner within said injection well which extends the entire length thereof, said perforations positioned in the portion of said injection well in contact with said formation;
drilling and completing a plurality of production wells into said formation positioned above and along the length of said injection well;
circulating a heated fluid through said injection well contacting said formation via said perforations and thereby reducing the viscosity of said bitumen contained therein;
recovering said bitumen of reduced viscosity via said production wells.

3,960,214

RECOVERY OF BITUMEN BY STEAM INJECTION

John Howard Striegler, Richardson, and Eddie Paul Howell, Plano, both of Tex., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed June 6, 1975, Ser. No. 584,518
Int. Cl.² E21B 43/24, 33/138
U.S. Cl. 166—272 6 Claims



1. Method of recovering bitumen from a subterranean tar sand formation containing bitumen which comprises:
drilling and completing an injection well to said formation and extending same into said formation, casing said injection well;
drilling and completing a plurality of production wells into said formation positioned above and along the length of said injection well;
perforating the portion of said cased injection well in contact with said formation, circulating a heated fluid through said injection well contacting said formation via said perforations and thereby reducing the viscosity of said bitumen contaned therein;
recovering said bitumen of reduced viscosity via said production wells.

3,960,215

METHOD AND APPARATUS FOR PERFORMING SEQUENTIALLY TIMED OPERATIONS IN A WELL

Neal L. Mitchell, Taft, Calif., assignor to Chevron Research Company, San Francisco, Calif.

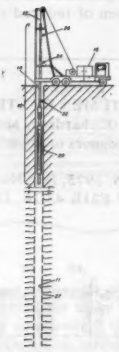
Division of Ser. No. 510,260, Sept. 30, 1974. This application May 9, 1975, Ser. No. 575,886
Int. Cl.² E21B 43/00, 47/00
U.S. Cl. 166—315 2 Claims

1. In a wire line device for use in performing sequentially timed operations in a well comprising:
operating means for performing sequential operations in a well and sequencing timer actuating means for operating said operating means, said sequencing timer actuating means comprising a cylinder, an orifice in said cylinder, a noncompressible liquid in said cylinder upstream of said orifice, means for applying pressure on said liquid upstream of said orifice to move said liquid through said orifice and stem means downstream of said orifice, said stem means connected to said operating means to operate said operating means on movement of said stem means, said stem means being moved in response to flow through said orifice.

2. The method of performing sequential operations in a well comprising:
flowing a noncompressible liquid through an orifice,

running into a well a wire line device capable of having a performing timed sequential operation,

lowering said device down said well before the elapse of a predetermined time as determined by flow of said liquid through said orifice to position said device in said well,



operating a series of timed sequential operations of said device in response to said flow of liquid through said orifice.

3,960,216

FIRE-EXTINGUSHING EQUIPMENT

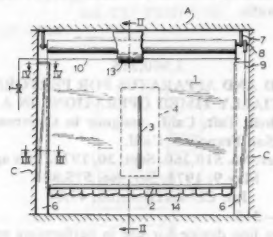
Mineo Isobe, No. 1111, Sanyso-cho, Suzuka, Mie, Japan

Filed Jan. 28, 1975, Ser. No. 544,917

Claims priority, application Japan, Jan. 28, 1974, 49-11653; Mar. 4, 1974, 49-25408; May 21, 1974, 49-57529; Aug. 14, 1974, 49-93599

Int. Cl.² E06B *5/16*

U.S. Cl. 169—48 **31 Claims**



1. A fire preventing and extinguishing apparatus for use inside buildings, said apparatus comprising:

roller-mounted curtain means for separating a burning area from a non-burning area;

support means attached to the upper portion of said curtain means for suspending and rolling up said curtain means;

water feed means adjacent the upper portion of said curtain means and said support means for continuously supplying water to the surface of said curtain means, whereby water flows from the upper portion of said curtain means downward over the entire surface thereof; and

reservoir means along the bottom portion of said curtain means for receiving and containing therein the water flowing downward over the surface of said curtain means.

3,960,217

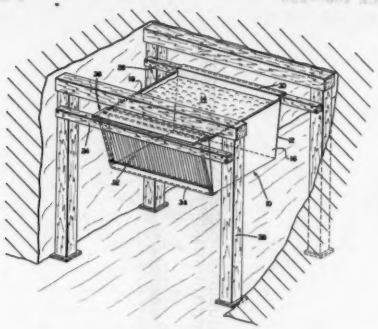
PASSIVE EXPLOSION BARRIER

Israel Liebman, Library, and John Corry, Elrama, both of Pa., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Oct. 14, 1975, Ser. No. 622,343

Int. Cl.² A62C *35/04*

U.S. Cl. 169—64 **12 Claims**



1. Apparatus mountable to first and second spaced apart beams adjacent a mine roof for suppressing explosions, comprising:

a receptacle for storing an explosion suppressing substance, one side of said receptacle having a first support flange for mounting said one side on said first beam;

a face plate pivotally attached to the opposite side of said receptacle, said plate having a second support flange for mounting said opposite side on said second beam;

said face plate being pivotable from a first position to a second position in response to wind forces of an explosion;

said face plate forming a first angle with a horizontal plane in said first position, wherein said first and second support flanges are separated from each other by a first distance sufficient for mounting said flanges respectively on said first and second beams; and

said face plate forming a second angle with the horizontal plane in said second position, said second angle being larger than said first angle, wherein said first and second support flanges are separated from each other by a second distance insufficient for mounting said flanges respectively on said first and second beams, said receptacle spilling said suppressing substance in the path of the explosion.

3,960,218

GRASS-CLEARING DEVICE FOR LAWN-SPRINKLER HEADS

Fenimore Edward Atchley, 23333 Ridge Route Drive, No. 37, and Betty Lou Gilliam, 24562 Blackfoot Drive, both of El Toro, Calif. 92630

Filed July 2, 1975, Ser. No. 592,548

Int. Cl.² A01G *3/06*

U.S. Cl. 172—13 **2 Claims**

1. A grass-clearing device for sprinkler heads related to underground water systems, wherein the device comprises:

a main-support body having holes disposed adjacent the free ends thereof;

a pair of cutting blades slidably attached to each of said free ends of said main-support body, wherein said cutting blade comprises:

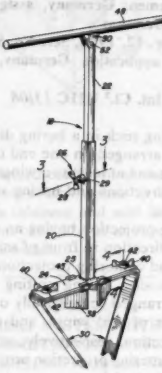
a horizontal arm member having an elongated slot disposed therein and a free end, said elongated slot being arranged to be aligned with respective holes of said main-support body;

a depending, cutting, leg member formed as an integral part of said horizontal arm member, and bent inwardly thereof, having dual-cutting edges formed thereon, said leg member terminating with a free end;

wherein said cutting, leg member includes a lateral, cutting edge disposed at the free end of said cutting leg member, and wherein a semi-circular notch is formed therein;

a pair of tabs integrally formed as part of each said horizontal arm member said tabs being inwardly bent to slidably receive said main-support body therethrough, thereby preventing lateral movement of said cutting blades:

a pair of V-shaped, jaw members, each being secured adjacent said free end of each said horizontal arm member, wherein the jaw members are positioned opposite to each other, to receive one of said sprinkler heads therebetween;



means for adjusting said cutting blades to the proper distance apart with respect to the size of said sprinkler head, said means for adjusting said cutting blades being received in said elongated slots of said horizontal arm members and said holes disposed in said main-support body;

a handle shaft having a first tubular shaft, one end of which is affixed to said main body, and a second shaft adapted to be received in said first tubular shaft, said first and second shafts having matching cross-sectional configurations, whereby said second shaft is prevented from rotation therein;

a handle grip moveably attached to one end of said second shaft thereof, whereby said handle grip can be folded for storage; and

locking means mounted to said telescoping, handle shaft, whereby said handle shaft can be positioned at a predetermined length.

3,960,219

SOIL CULTIVATING IMPLEMENTS

Cornelis van der Lely, 7, Bruschenrain, Zug, Switzerland

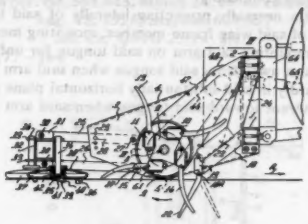
Filed Apr. 22, 1974, Ser. No. 462,942

Claims priority, application Netherlands, Apr. 26, 1973, 7305802

Int. Cl.² A01B *33/02, 49/02*

U.S. Cl. 172—39 **18 Claims**

1. A soil cultivating implement comprising a frame movable over the ground and at least one rotor supported on said frame, said rotor being mounted for rotation about a substantially horizontal axis and having a plurality of elongated soil-working tines, driving means connected to said rotor and said tines, said driving means driving the tines through the soil in a direction generally parallel to the direction of travel of said implement, said tines each having a lower free end that is orientated rearwardly with respect to the normal direction of rotation of said rotor, said tines each having a fastening portion mounted in a corresponding holder on support means of said rotor and said holder having a longitudinal axis, said



longitudinal axis of the holder and said fastening portion extending substantially tangentially with respect to a circle concentric with said axis of rotation.

3,960,220

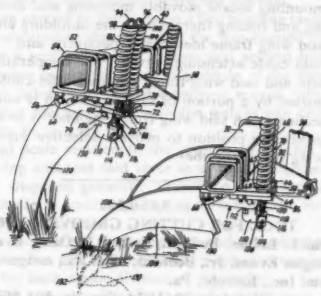
SUBSOIL PLOW

Veikko A. Laitala, Rte. 6, Box 215, Rochester, Ind. 46975

Filed Dec. 9, 1974, Ser. No. 530,663

Int. Cl.² A01B *61/00, 13/08*

U.S. Cl. 172—261 **7 Claims**



1. Plow apparatus comprising a supporting frame having front and rear sides, a plow element mounted on said frame for pivotal movement about a horizontal axis in a direction fore and aft of said frame,

holding means for releasably holding said plow element generally upright in plowing position,

means for yieldably pivoting said plow element and holding means forwardly whereby forward movement of said plow element through the soil will be accompanied by vibratory pivotal motion thereof,

said yieldable pivoting means including a reaction member mounted on said frame for pivotal movement about said horizontal axis, said holding means being carried by said reaction member whereby said plow element and said reaction member may pivotally vibrate in unison.

3,960,221

TILLAGE TOOL TRANSPORT ARRANGEMENT

Calvin B. Blair, P.O. Box 76, and John W. Blair, P.O. Box 47, both of Barnard, Kans. 67418

Filed Sept. 18, 1974, Ser. No. 506,957

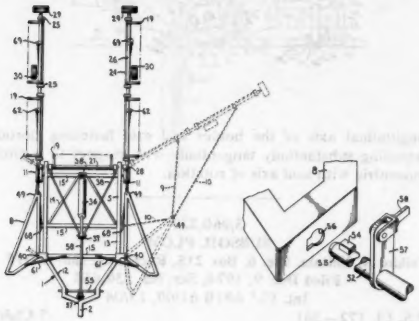
Int. Cl.² A01B *73/00*

U.S. Cl. 172—311 **6 Claims**

3. In an agricultural tillage implement having a drawn tongue and a foldable wing frame member, said implement being movable in a substantially horizontal plane, said wing

frame member being operably connected to said tongue and normally projecting laterally therefrom, and a cable for resisting the rearward deflection of said wing frame member, the improvement comprising:

a. an arm normally projecting laterally of said tongue in front of said wing frame member, mounting means movably mounting said arm on said tongue for unfolding of said arm away from said tongue when said arm is moved forwardly in said substantially horizontal plane and folding thereof toward said tongue when said arm is moved



rearwardly in said substantially horizontal plane, said mounting means movably mounting said arm for unfolding and folding thereof with the unfolding and folding of said wing frame member respectively; and

b. said cable extending between and cooperating with said arm and said wing frame member, said cable being supported by a portion of said arm which is outwardly projecting when said wing frame member is in said laterally projecting position to provide selective support for said wing frame member.

3,960,222

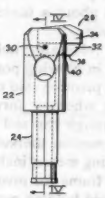
TOOL FOR CUTTING GROOVE IN HOLE

Donald L. Leibee, Bedford; Seibert S. Oaks, Everett, and R. Douglas Evans, Jr., Bedford, all of Pa., assignors to Kennametal Inc., Latrobe, Pa.

Filed Aug. 29, 1974, Ser. No. 501,803

Int. Cl.² E21B 9/26

U.S. Cl. 175—263 **10 Claims**



1. A tool for forming at least one groove in the wall of a hole, especially in a hole in an earth formation, said tool comprising; a block-like body having a longitudinal axis, said body having a forward end and a rearward end, means at the rearward end of said body adapted for engagement by a driver for moving the tool axially and for driving the tool in rotation on the axis thereof, said body being freely receivable in and movable axially along the hole to be grooved, pivot means located near said central axis on the forward end of said body, a cutting element having one end pivotally mounted thereon and having a first pivotal position on said body wherein the other end of said cutting element protrudes radially from the body for forming a groove, cooperating elements of abutment means on said cutting element and said body to support said cutting element in said first position on said body during the forming of a groove, the length of said cutting element which protrudes radially from said body when said cutting element is in said first position thereof on said body being no greater than the length of the cutting element within the envelope of the body, said cutting element having a second position on said body wherein it is disposed entirely within the envelope of said body to permit free axial movement of the tool in the hole, said cutter element being freely movable between said first and second positions thereof and the position of said cutting element on said body being determined by the direction of movement of said body in the hole.

3,960,223

DRILL FOR ROCK

Werner Kleine, Bremen, Germany, assignor to Gebrueder Heller, Uphusen, Germany

Filed Mar. 12, 1975, Ser. No. 557,779

Claims priority, application Germany, Mar. 26, 1974, 2414354

Int. Cl.² E21C 13/08

U.S. Cl. 175—385 **20 Claims**

1. A drill for boring rock in a boring direction comprising a boring head body arranged on one end of a drill shank and having a central axis and at least two wings radially extending in different radial directions and having surfaces pointing in said boring direction,

an axial centering projection having an end which projects in said boring direction in front of said wings,

said wings and said centering projection constituting carriers of cutter bodies having cutting edges, said cutter bodies being arranged eccentrically on radial outer ends of said surfaces of said wings, and on the end of said centering projection, respectively, said centering cutter body on said centering projection projecting radially from said central axis and having a centering point on said central axis pointing in said boring direction, said eccentrically arranged cutter bodies having radial inner ends disposed from said centering cutter body at radial distances such that parts of said surfaces of said wings located radially between said inner ends and said centering cutter body form breaker surfaces serving during drilling to break annular surfaces, unworked by said cutter bodies, of rock to be bored,

said boring head having channel type surfaces positioned between said wings,

said centering projection having an outer surface defining centering projection jacket lines,

each of said channel type surfaces having at least one bottom jacket line extending longitudinally to the longitudinal axis of said boring head body and directly joining one of said centering projection jacket lines, and said bottom jacket line forming at least at its joining end an obtuse angle with respect to said one centering projection jacket line.

3,960,224

PRECISION CUT-OFF WEIGHING APPARATUS

Charles Silvers, 6500 N. Bay Road, Miami Beach, Fla. 33141

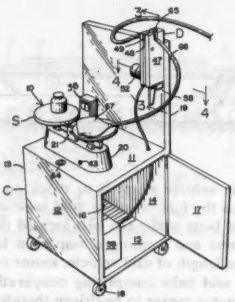
Filed June 6, 1975, Ser. No. 584,572

Int. Cl.² A61B 5/14; G01G 13/30

U.S. Cl. 177—47 **5 Claims**

1. A precision cut-off weighing apparatus comprising a balance having arm portions, means pivoting said arm portions for weighing articles placed thereon, a magnet mounted on one of said arms, reed switch means mounted in proximity of said magnet but out of the influence of the magnetic attraction of said magnet when said arm portions are in an unbalanced condition, a support, a lever pivotally mounted on said support, tubular member support means mounted on said support in the path of movement of said pivoted lever, restraining means mounted on said support preventing the piv-

otal movement of said lever, further means connected to said lever urging the pivotal movement of said lever, power operated means connected to said reed switch means and said restraining means whereby upon the swinging of said one arm

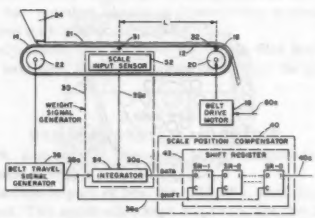


portion in an unbalanced condition and said magnetic attraction causing said reed switch means to become closed, said restraining means is released and said further means effects the pivotal movement of said lever to swing in the direction of said tubular support means.

3,960,225
CONVEYOR BELT SYSTEM WITH POSITIONAL TRANSFORMATION OF WEIGHT DATA

Frank S. Hyer, Duxbury, and Raymond Karosas, Quincy, both of Mass., assignors to Hyer Industries, Inc., Pembroke, Mass.

Continuation of Ser. No. 418,088, Nov. 21, 1973, abandoned. This application Aug. 5, 1974, Ser. No. 495,068
Int. Cl.² G01G *13/04*
U.S. Cl. 177—121 **35 Claims**



1. Apparatus for a belt conveying a stream of material thereon, said apparatus having, in combination,

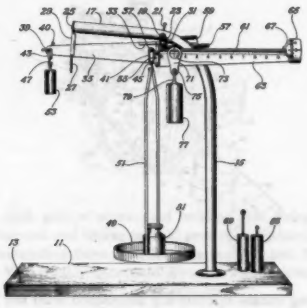
means to generate, at a time when a portion of the belt is adjacent a first reference point, a first weight signal associated with said portion,

means to convert said signal to a stream of substantially uniform pulses including means to delay said pulse stream relative to said first weight signal for the time interval required for said portion to reach a position adjacent a second reference point downstream of the first reference point, said delayed pulse stream having an instantaneous pulse repetition rate proportional to the weight rate of flow of material associated with the portion of the belt adjacent the second reference point.

3,960,226
WEIGHING SCALE WITH TEN TIMES SENSITIVITY INCREASE

Daniel R. Wood, Fort Worth, Tex.

Division of Ser. No. 561,043, March 24, 1975. This application Aug. 13, 1975, Ser. No. 604,357
Int. Cl.² G01G *23/14, 1/18*
U.S. Cl. 177—164 **3 Claims**



1. A weighing machine comprising:

a stand;

a fulcrum carried by the stand in a selected vertical plane;

a lever carried by and located below the fulcrum;

a weight pan carried by the lever on a first hanging means;

a tare poise equal to the weight of the pan carried by the lever on a second hanging means, said second hanging means being located at an even multiple of the distance from the fulcrum to the first hanging means, whereby exchanging the tare poise with the weight pan changes sensitivity by an even factor;

a graduated scale secured to the lever by a bracket, said scale being adjacent said lever in a different plane and laterally disposed generally parallel to the longitudinal axis of the lever, said scale having its zero in the vertical plane of the fulcrum;

a rotatable rod secured to the bracket and extending parallel to the scale, said rod containing a selected number of threads for each major division of the scale;

a detachable poise carried on the rod by a hanger, said hanger capable of being manually slid along the rod and also mating with the threads of the rod for advancement by rotating the rod;

an adjusting weight attached to the lever for adjusting the resultant moment on one side of the fulcrum to equal the resultant moment on the other side of the fulcrum while the poise is at zero and in the vertical plane of the fulcrum.

3,960,227
HIGH SPEED WEIGHING SCALE

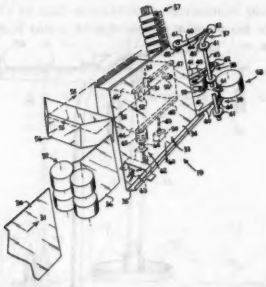
Fredric E. Zucker, Stamford, Conn.; Anthony Storace, Tarrytown, N.Y., and Paul R. Sette, Hamden, Conn., assignors to Pitney-Bowes, Inc., Stamford, Conn.

Division of Ser. No. 522,712, Nov. 11, 1974, which is a division of Ser. No. 476,655, June 5, 1974. This application Mar. 28, 1975, Ser. No. 563,192
Int. Cl.² G01G *3/14, 3/08, 21/22*
U.S. Cl. 177—210 **10 Claims**

1. A weighing scale for weighing a piece of mail supported on its edge, comprising:

a weighing tray physically constructed to receive and support a piece of mail upon an edge thereof, said tray being movably supportable for movement through a weighing range, said tray comprising a horizontally disposed base section and at least one wall member extending from said

base section, an edge of a piece of mail to be weighed being received and supported upon said base section, and said wall member lending additional support to the piece of mail for maintaining said piece of mail upon said edge; supporting means supporting said weighing tray for movement through a weighing range; and



measuring means operatively associated with the weighing tray for measuring the degree to which the weighing tray moves through said weighing range when supporting a piece of mail, whereby a weight determination may be made for said piece of mail.

3,960,228

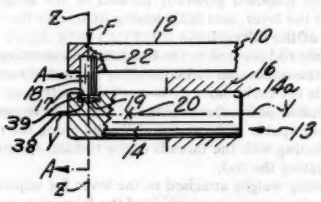
SHEAR BEAM LOAD CELL

Kjell Helge Nordstrom, Vasteras, Sweden, assignor to Transearch AB, Vasteras, Sweden

Filed May 31, 1974, Ser. No. 475,060

Int. Cl.[2] G01G 3/14

U.S. Cl. 177—211 **17 Claims**



1. Apparatus comprising a carrier for receiving a load thereon, a load cell operative to sense forces applied thereto in a load-measuring direction, said load cell comprising a beam and shear-sensing transducer means carried by said beam, means for retaining said carrier in place relative to said load-sensing means and for applying at least a portion of a load supported by the carrier to said load cell in said load-measuring direction upon positioning of the load on said carrier, said last mentioned means comprising a carrier support member connected to said carrier and adapted to limit relative movement therebetween in directions transverse to said load measuring direction, means defining a radially oriented recess in said beam, said radially oriented recess including an inward end surface defining a load receiving surface, said carrier support member extending into said radially oriented recess and being effective to transmit a force proportional to at least a portion of said load to said load receiving surface in the load measuring direction, said radially oriented recess defining means for resisting relative movement of said carrier support member in directions transverse to said load measuring direction.

3,960,229

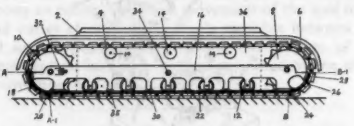
ELECTROMAGNETIC VEHICLE

Cheng Shio, 145-34 34th Ave., New York, N.Y. 11354

Filed Mar. 31, 1975, Ser. No. 563,724

Int. Cl.[2] B62D 63/02

U.S. Cl. 180—1 VS **15 Claims**



1. A movable vehicle adapted to move on inclined steel surfaces, such as the hull of a ship, said vehicle comprising a frame, a pair of belts with each belt located on a respective side of said frame and forming a loop, said loop extending substantially the length of said vehicle, motor means for driving said belts, said belts comprising cooperating means for engaging said motor means to be driven thereby, each of said belts comprising a plurality of electromagnetic shoes attached to the outer face of said belts, each of said electromagnetic shoes comprising a wire wound core adapted to provide a magnetic force when energized to enable said vehicle to adhere to said surfaces, electrical conductor means attached to the bottom portion of said vehicle for delivering electrical current, each of said elecromagnetic shoes comprising electrical contact means for contacting said electrical conductor means and carrying electrical current to said electromagnetic shoe as said shoe passes along the bottom of said vehicle.

3,960,230

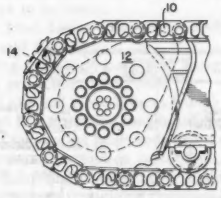
MOTOR DISCONNECT MEANS

Charles M. G. Van Wuytswinkel, Thimeon, Belgium, assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jan. 23, 1975, Ser. No. 543,575

Int. Cl.[2] B60K 17/10

U.S. Cl. 180—9.62 **11 Claims**

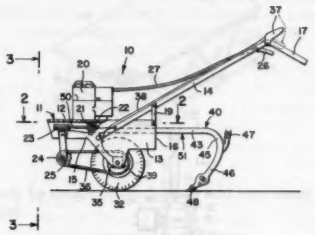


1. Final drive means for a machine having first and second oppositely disposed traction means, said final drive means including interchangeable housing means for use on the final drive means for either said first or second traction means, said housing means being interchangeable without modification, said housing means having removable cover plate means, said cover plate means having an opening located centrally of said cover plate means, said housing means further includng cap member means for selectively removable disposition over said opening to substantially close off said opening, said cap member means including first aperture means for providing access to internal components of said final drive means for selectively rendering said final drive inoperative, said first aperture means being located concurrently centrally of said cap member means and said opening, first plug means normally removably disposed within said first aperture means to close said first aperture means.

3,960,231
GARDEN TRACTOR

John B. McCormick, Lake City, Fla., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Oct. 23, 1974, Ser. No. 517,256
Int. Cl.² B62D 51/04
U.S. Cl. 180—19 R 3 Claims



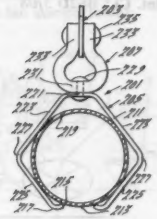
1. A garden tractor, which comprises:
a. a support frame;
b. an engine having a vertical drive shaft mounted onto said support frame;
c. a drive pulley mounted onto said vertical drive shaft;
d. a worm reduction gear box;
e. a downwardly extending V belt slip clutch assembly communicating with said worm gear reduction box;
f. a V belt communicating with said drive pulley and V belt slip clutch assembly;
g. a small sprocket wheel communicating with said worm gear reduction box;
h. a horizontal axle rod rotatably affixed to said support frame;
i. a tire having a center hub mounted onto said horizontal axle;
j. second means for communicating said small sprocket wheel to said horizontal axle;
k. a clutch control assembly;
l. a rearwardly extending elongated rectangularly shaped flat bar member pivotally mounted to said support frame;
m. a horizontally placed spring affixed to said support frame and frictionally engaging said elongated flat bar member, said bar member having a downwardly extending rear hooked end; and
n. an adjustable foot member affixed to said hooked rear end, said foot member adapted to engage the ground.

3,960,232
EXHAUST SYSTEM MOUNTING

Franklin R. Hubbell, III, Brookyln, Mich., assignor to Tenneco Inc., Racine, Wis.

Continuation-in-part of Ser. No. 211,585, Dec. 23, 1971, abandoned. This application Sept. 17, 1973, Ser. No. 398,540
Int. Cl.² B60K 13/04
U.S. Cl. 180—64 A 7 Claims

1. In an exhaust system for motor vehicles having a frame and an internal combustion engine discharging exhaust gases into the system, said system including a silencing member and at least one exhaust gas conducting conduit connected to the silencing member, mounting means each comprising a single vertically extending hanger strap for supporting the system on the engine and frame at a plurality of points spaced apart lengthwise of the system, said mounting means each including a vertically extending post element and at least one conduit snap-in clamp member attached to the post element and simultaneously engaging top and bottom parts of the conduit and having a pair of laterally resilient jaws shaped to fit around at least a major portion of the periphery of said conduit and resiliently hold the conduit in the clamp member between the jaws, said jaws having ends spaced apart by less than the width of the conduit to define an expandable resilient mouth for snap-in insertion and removal of the conduit, said clamp member being formed of a single piece spring metal strip so that the jaws are inherently resilient, said strip beng shaped to have two pais of substantially straight sides and a holding side

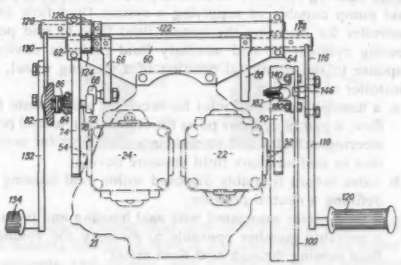


between each pair of sides, said holding side being substantially horizontal and fitting on said post element and said pairs of sides extending from said holding section and being substantially V-shaped to form said jaws and a connector securing said post to opposite sides of said strap.

3,960,233
SPEED CONTROL MECHANISMS FOR VEHICLES

Edward John Aldred, Ipswich, England, assignor to Ransomes Sims & Jefferies Limited, Ipswich, England

Filed Mar. 18, 1974, Ser. No. 452,427
Claims priority, application United Kingdom, Mar. 23, 1973, 14238/73
Int. Cl.² B60K 26/00
U.S. Cl. 180—77 R 13 Claims



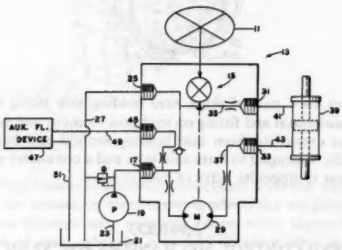
1. A speed control mechanism for controlling the supply of driving power to traction means of a vehicle, comprising means for supplying power to the traction means, a control member movably mounted on the vehicle and operable by the driver of the vehicle, said control member being movable continuously over a range of positions for varying the speed of the traction means or varying the supply of power to the traction means, and a selector means for limiting the movement of said control member, said selector means being movable between a plurality of different positions for limiting the range of movement of the control member to thereby limit the range over which the speed of the traction means can be varied, or the range of power which can be supplied to the traction means, in response to movement of the control member, in which the selector means and control member are interconnected, said control member having a neutral position in which said selector means and said control member are not inter-connected, said selector means being movable from any one of its positions to another only when said control member is in its neutral position.

3,960,234

CONTROLLER FOR FLUID PRESSURE OPERATED DEVICES PROVIDING HIGH PRESSURE TO AN AUXILIARY DEVICE

David Frederick Morgan, Minnetonka, Minn., assignor to Eaton Corporation, Cleveland, Ohio

Filed Sept. 18, 1974, Ser. No. 507,041
Int. Cl.² B62D 5/08
U.S. Cl. 180—132 5 Claims



5. A vehicle hydraulic power steering system including a power steering cylinder, an auxiliary fluid pressure device, a fluid pump capable of supplying a system fluid flow and a controller for directing the system fluid flow to said power steering cylinder or said auxiliary fluid pressure device in response to the rotational position of a steering wheel, said controller comprising:

a. a housing having an inlet for receiving said system fluid flow, a pair of cylinder ports for connection to said power steering cylinder and an auxiliary fluid port for connection to said auxiliary fluid pressure device;

b. valve means rotatably disposed within said housing and defining a neutral position;

c. a fluid meter associated with said housing and including a movable member operable to measure the volume of fluid passing through said fluid meter;

d. said valve means cooperating with said housing to define first and second supply passages in continuous open communication with said inlet and a first flow path including said inlet, one of said cylinder ports, said fluid meter, the other of said cylinder ports, and said outlet when said valve means is rotatably displaced from said neutral position;

e. said valve means cooperating with said housing to further define a second flow path communicating between said inlet and said auxiliary fluid port when said valve means is in said neutral position, said valve means defining first and second auxiliary passages communicating between said auxiliary fluid port and said first and second supply passages, respectively, when said valve means is in said neutral position, said first and second supply passages and said first and second auxiliary passages being oppositely and approximately equally disposed about said auxiliary flow port; and

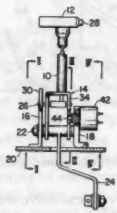
f. said first and second flow paths each being capable of communicating substantially all of said system fluid flow, said first flow path having priority over said second flow path.

3,960,235

TRANSMISSION LOCKING SYSTEM

Tetsuya Iijima, Tokyo, Japan, assignor to Nisan Motor Co., Ltd., Yokohama, Japan

Filed Dec. 23, 1974, Ser. No. 535,682
Claims priority, application Japan, Dec. 24, 1973, 48-143579
Int. Cl.² B60R 21/10, 25/06
U.S. Cl. 180—82 A 6 Claims



1. A transmission locking system for a motor vehicle, comprising electric locking means movable between a rest position to allow a transmission of the vehicle to be shifted into a driving gear and a locking position to lock said transmission in a neutral position in which the vehicle is unable to start to move, first sensing means sensing that the driver sits down on his seat of the vehicle to produce a first output signal and sensing that the driver is absent from his seat to produce a second output signal, second sensing means sensing that the driver fails to carry out a precautionary procedure for his safety and protection when said first sensing means produces said first output signal to produce an output signal, and an electric control circuit connected to said first and second sensing means and to said electric locking means and responsive to said output signal of said second sensing means to produce an output signal to move said electric locking means said rest position into said locking position, in which said electric control circuit comprises a first bistable memory circuit which is set by said second output signal of said first sensing means to produce an output signal and which is reset by said output signal of said second sensing means to cease to produce said output signal, a first AND gate circuit for producing an output signal only when said first output signal of said first sensing means and said output signal of said bistable memory circuit are concurrently present, and an OR gate circuit for producing an output signal when only one of said output signal of said second sensing means and said output signal of said AND gate circuit is present, said electrical locking means being moved from said rest position into said locking position to lock said transmission in said neutral position when said output signal of said OR gate circuit is present.

3,960,236

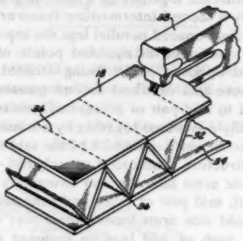
LOCK CORE PANEL

Richard N. Holmes, Laguna Beach, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Filed June 17, 1974, Ser. No. 479,842
Int. Cl.² E04B 1/99
U.S. Cl. 181—33 G 4 Claims

1. A lock core panel comprising: layers of strands forming a face sheet, said face sheet having openings therein through which acoustic energy may pass into said panel; a base sheet

spaced from said face sheet and impervious to sound waves; and a corrugated core sheet, said core sheet being connected



alternately by means of stitching to said base sheet and to said face sheet.

3,960,237

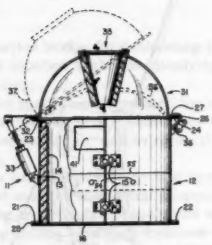
SOUND REDUCING ENCLOSING

David P. Sleeper, Waltham, Mass., assignor to Ecology Controls, Inc., Waltham, Mass.

Filed Mar. 10, 1975, Ser. No. 556,813

Int. Cl.² F02F 7/00; F01N 1/10

U.S. Cl. 181—33 K **10 Claims**



1. Sound reducing enclosing apparatus comprising,

cylindrical means internally lined with sound absorbing material for surrounding a machine and absorbing noise therefrom,

base means for supporting said cylindrical means and formed with an opening for accommodating a machine to be enclosed,

and cover means securable to said cylindrical means for coacting with the latter and said base means for enclosing a machine internally thereof and reducing the sound transmitted outside said enclosure while providing visible access to the enclosed machine,

said cover means comprising transparent solid material and having depending sound absorbing means for absorbing sound energy produced by an enclosed machine.

3,960,238

SOUND ATTENUATING ENGINE ENCLOSURE

Randall D. McClure, and Jerry G. Marques, both of Decatur, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Apr. 30, 1975, Ser. No. 573,216

Int. Cl.² G10K 11/04

U.S. Cl. 181—33 K **5 Claims**

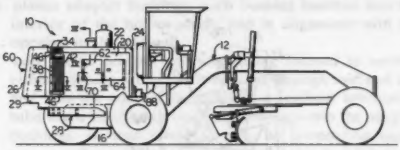
1. A sound attenuating engine enclosure comprising:

two side panels, front and rear portions, a hood member and a belly cover, said components defining generally an engine compartment and an engine heat exchanger and fan compartment;

sealing means about the periphery of said side panels for forming a substantially airtight barrier therearound;

said hood member being formed with a multiplicity of apertures formed therein substantially adjacent the fan compartment;

air passage means in each of said side panels adjacent the fan compartment to permit air flow therethrough and access to the fan compartment;



means in said side panels to permit access to the engine compartment;

said front portion having air passage means therethrough;

sound attenuating means secured to the inside surfaces of said side panels and front portion; and

a belly cover seal supported by said belly cover, said seal being complementally formed to the shape of the belly area wherein said seal engages the belly housing when said belly cover is installed in place.

3,960,239

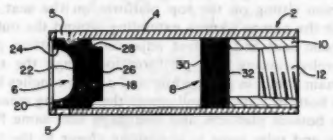
NOISE-REDUCING FLUID-FLOW DEVICES

Alain Frochaux, Boston, and Charles M. Salerno, Wayland, both of Mass., assignors to Barry Wright Corporation, Watertown, Mass.

Filed Aug. 15, 1973, Ser. No. 388,636

Int. Cl.² F01N 1/10; B21D 53/00

U.S. Cl. 181—49 **19 Claims**



1. A noise-reducing fluid flow device comprising an elongate housing having an inlet at one end thereof, an outlet at an opposite end thereof, and a passageway for carrying a stream of pressurized fluid from said inlet to said outlet, said one end being adapted for connecting said inlet to a source of pressurized fluid and said outlet being open to the atmosphere exterior of said housing; and a noise-silencing element for reducing the noise level of said stream of pressurized fluid passing out of said passageway via said outlet, said noise-silencing element being positioned wholly within said housing and extending fuly across said passageway at said outlet, at least a portion of said passageway commencing at the upstream side of said noise-silencing element and extending toward said inlet being unobstructed to flow of pressurized fluid, said noise-silencing element being frictionally gripped by the internal surface of said housing and being made of a knitted metal wire mesh fabric that has been rolled up and compressed and molded into a self-supporting, dense, porous mass with the wire threads of said fabric intermingled and forming a myriad of relatively short length spring wire spans that are oriented randomly in said mass, said fabric being made of metal wire with a substantially round cross-section.

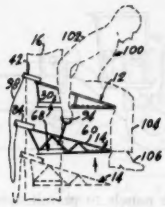
said housing being made of a material with a hardness less than that of the metal wire threads of said wire mesh fabric;

3,960,240

TREE CLIMBING DEVICE

C. W. Cotton, Rte. No. 11, Central Church Road, Douglasville, Ga. 30134

Filed Sept. 16, 1974, Ser. No. 506,034
Int. Cl.[2] A63B 27/00; E04G 3/10
U.S. Cl. 182—20 6 Claims



1. In a tree climbing device:

a top platform having an occupant seat thereon which extends near the front outer edge of said platform and on which an occupant sits facing outwardly from the tree during part of the time that the tree climbing device is being raised to a higher level, a bottom platform mounted on the same side of the tree below said top platform and extending in the same direction in spaced relation thereto, each of said top and bottom platforms projecting substantially coextensively outwardly and each having tree engaging means thereon comprising a means on each side of said tree engageable with the tree by means of the weight of the person to retain said platform thereon, said tree engaging means on each platform being disengageable from the tree by tilting the projecting platform upwardly after relieving the weight thereon, grasping means on each side of said bottom platform for grasping by a person sitting on the top platform on the seat thereon with the person's knees extending around the outer edge of said seat and his feet adjacent the bottom platform thereby causing said platform to engage the tree and remain firmly in place while said person reaches below to the bottom platform and grasps the grasping means to lift the bottom platform and disengage said same from the tree and raise same to a position closer to the top platform, said top platform being raised by said person rising from the edge of said seat on said top platform by straightening the body from a substantially seated position to rise off the top platform seat and thereby relieve the amount of weight of the person on the top platform which is located behind the person between the person and the tree being climbed and then reaching behind to tilt said platform to release same from engagement with said tree and to raise same behind the person's back while the person continues to arch forward with his weight substantially placed upon the bottom platform thereby raising the top platform behind a person's back at a higher level than previously and thereafter again sitting on said seat on top platform to engage same with the tree and repeating the previous operation of raising the lower platform, first one and then the other until the desired height has been attained.

3,960,241

FURNITURE FOLDABLE STRUCTURE

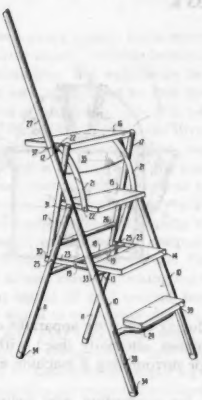
Anibal Aguirre Arias, Cali, Colombia, assignor to Escalesilla Tresaes Ltd., Cali, Colombia

Filed Nov. 19, 1975, Ser. No. 633,506
Int. Cl.[2] A47C 13/00
U.S. Cl. 182—33.3 6 Claims

1. Furniture foldable structure, unfoldable to provide either a chair having a seat or ladder structure, which foldable structure comprises the combination of,

a pair of side straight spaced parallel poles, said poles being rigidly connected together by a first top transverse member and by a second intermediate transverse member; a pair of straight spaced parallel legs the top ends of which are pivot connected at opposed points of said pair of poles, said opposed points being located between the points where said first and second transverse members are joined to said pair of poles, said pair of parallel legs being rigidly connected together by a transverse member located just beneath underside of the said seat when said foldable structure is unfolded as a chair;

a pair of side arms laterally and swingingly arranged between both said pair of poles and said pair of legs with each of said side arms having their rear ends pivotally joined to each of said legs on opposed points thereof located at a plane just beneath the underside of the said seat when said foldable structure is unfolded as a chair, the front end of said pair of side arms rigidly embracing therebetween the side edges of a rectangular board, said pair of side arms being articulated together by a fitting member oscillably linking the same to said second transverse member so that when said pair of side arms together with its board rigidly associated therebetween is turned around their pivot connecting means, the movement is applied to move near or away said pair of poles toward or from said pair of legs;



a pair of parallel elongated side members laterally and swingingly arranged between both said pair of poles and said pair of legs with each of said elongated members having their rear ends pivotally connected to each of said legs on opposed points thereof, said parallel elongated members being rigidly connected together toward their rear end by a cross member, said elongated members being provided at their intermediate portion with inwardly extended stop lugs;

a said seat comprising first rectangular board section being pivotally joined between the front length of said pair of elongated members by opposed pivot connecting means located toward the front side edges of said first board section, and a second rectangular board section, with its front edge arranged in proximity to the rear edge of said first board section, being pivotally joined between the rear length of said pair of elongated members by opposed connecting means located toward the front side edges of said second board section;

rigid articulating means swingingly linking the side edges of said first and second board sections at opposed points toward the front end edges of said first board section and at opposed points toward the rear end edges of said sec-

ond board; and

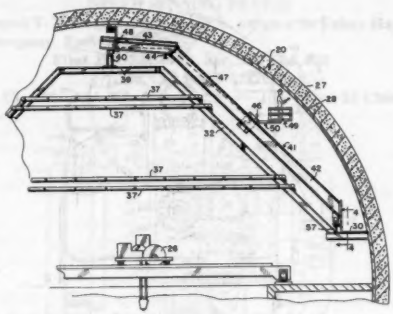
a lower horizontal board removably arranged on the lower length of said pair of poles, slidingly engaged thereto by channeled assembling means.

3,960,242

ORBITAL SERVICE BRIDGE

Wallace J. Saxonmeyer, Chicago Heights, Ill., assignor to Whiting Corporation, Harvey, Ill.

Filed Dec. 1, 1972, Ser. No. 311,312
Int. Cl.² E04G 3/14
U.S. Cl. 182—36 7 Claims



1. An orbital service bridge for positioning a work platform at a desired work location within an overlying dome-shaped structure, comprising;

a pair of parallel spaced-apart inclined leg members;

a pair of parallel spaced-apart substantially horizontal span members attached at one end to respective ones of said leg members;

a cross member extending between said span member;

a pivotal support member for centrally supporting said cross member at the top of said dome-shaped structure;

wheeled support means extending between the other ends of said leg members for positioning said other ends of said leg members along a track extending along at least a portion of the circumference of the base of said dome-shaped structure;

means comprising a carriage slidably mounted on said leg members for positioning said work platform at the height of said desired work location; and

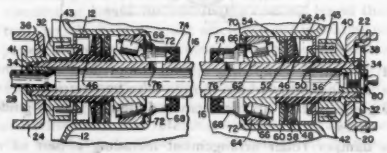
means for extending said work platform away from said inclined leg members in a substantially horizontal direction toward said desired work location.

3,960,243

ADAPTER BUSHING FOR LUBRICATION SYSTEM

Daniel Joseph Di Antonio, Nutley, N.J., assignor to Litton Systems, Inc., Passaic, N.J.

Filed May 7, 1975, Ser. No. 575,254
Int. Cl.² F16N 7/24
U.S. Cl. 184—6 8 Claims



1. A lubrication system for an idler roll, comprising, in combination:

a. an idler roll, having an outer housing and a hollow shaft extending axially therethrough,

b. bearings mounting the housing of said idler roll for rotational movement about its hollow shaft,

c. said hollow shaft having radial ports adjacent to the bearings,

d. end caps secured to the exterior surface of the hollow shaft at opposite ends, each end cap having a centrally located annular opening extending therethrough,

e. plastic adapter bushings, each bushing inserted into the interior of the hollow shaft, and in alignment with the opening in the end cap,

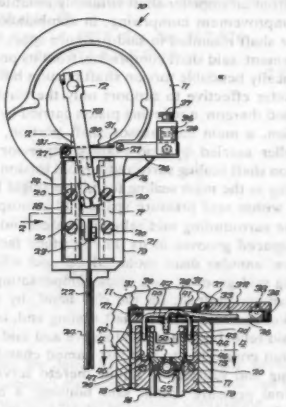
f. said plastic adapter bushings being formed to receive either a grease fitting when inserted through said end cap and into the adapter bushings or a resilient lubrication tube when inserted through the end caps into the adapter bushings, so that lubricant may be introduced under pressure through the grease fittings or so that lubricant once inserted will be forced through the radial ports to lubricate the bearings and will travel from the roll via the lubrication tube secured to the adapter bushing.

3,960,244

CLOTH CUTTING MACHINE WITH WICK LUBRICATOR

Frederick G. Clark, Naples, Fla., assignor to Eastman Machine Company, Buffalo, N.Y.

Filed Sept. 16, 1974, Ser. No. 506,013
Int. Cl.² F01M 1/00
U.S. Cl. 184—6.14 7 Claims

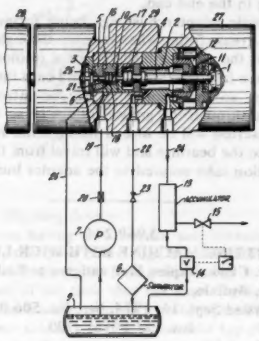


1. A cloth cutting machine comprising a housing, motor means on said housing, a crosshead, a pair of spaced crosshead guide means for supporting said crosshead for reciprocatory movement, link means coupled to said motor means, wrist pin means coupled between said link means and said crosshead, knife means coupled to said crosshead, a lubricant reservoir positioned above said crosshead, and wick means in communication with said lubricant reservoir functioning as conduit means for simultaneously conducting lubricant to both said crosshead guide means and said wrist pin means by gravity feed without any relative sliding contact between said wick means and said crosshead guide means and said wrist pin means which are to receive lubricant from said wick means.

3,960,245
LUBRICATING AND SEALING LIQUID FOR A HIGH PRESSURE COMPRESSOR

Hellmut Weinrich, Konigsbronn-Zang, Germany, assignor to Gutehoffnungshutte Sterkrade Aktiengesellschaft, Germany

Filed Jan. 29, 1975, Ser. No. 545,205
Claims priority, application Germany, Jan. 30, 1974, 2404270
Int. Cl.² F01B 35/00
U.S. Cl. 184—6.16 9 Claims



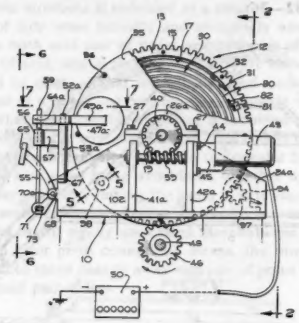
1. In a high-pressure compressor including a housing defining a pressure space including chambers and passages connected thereto for conveying sealing and lubricating liquid to and from an impeller shaft rotatably mounted in the housing, the improvement comprising, in combination, a stepped impeller shaft mounted in said pressure space for limited radial movement; said shaft comprising, from its power input end, an elastically bendable torsion shaft portion having the minimum diameter effective to support only the torsional stresses impressed thereon, a relieving piston carried by said torsion shaft portion, a main compressor shaft portion, and at least one impeller carried by said main compressor shaft portion; a torsion shaft sealing surrounding said torsion shaft portion and serving as the main sealing forming a shield between the pressure within said pressure space and atmospheric pressure; a sleeve surrounding said relieving piston and formed with axially spaced grooves in its inner surface facing said relieving piston; annular discs mounted on said relieving piston and facing said grooves, said discs compensating the axial thrust; a chamber defined, on the one hand, by said torsion shaft portion and said torsion shaft sealing and, on the other hand, by said relieving piston, said sleeve and said housing; a supply conduit connected to said last-named chamber and supplying sealing and lubricating liquid thereto serving to absorb the internal pressure within said housing; a bearing body surrounding the major portion of said main compressor shaft portion; a sealing and lubricating liquid-receiving tank; a draining conduit connecting the inner space of said bearing body to said tank; and a pressure-control valve and a liquid separator connected in series in said draining conduit.

3,960,246
SPRING POWER DEVICE

Elliott Fisher, 732 S. Lorraine Blvd., Los Angeles, Calif. 90005

Filed July 22, 1974, Ser. No. 490,676
Int. Cl.² F03G 1/00; H01H 3/16
U.S. Cl. 185—40 H 5 Claims

1. A spring power device comprising:
support means having a shaft rotatably mounted thereon,
a main drive gear freely journaled on said shaft,
a multiturn coil spring having its inner end anchored to said shaft and having its outer end anchored to said gear,
brake means for preventing said main drive gear from rotating until released,
an electric motor connected to rotate said shaft when energized,
a battery,
an electrical circuit including switch means automatically operable to connect said battery to energize said motor to wind up said coil spring whenever it winds down below a predetermined point, said switch means including a microswitch near the outer rim of said main drive gear, said battery being connected to energize said electric motor

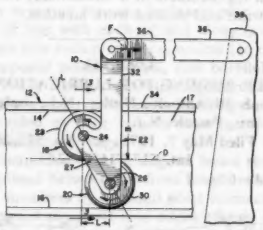


when the outermost turn of said coil spring moves radially outwardly to contact said microswitch, a holding circuit for keeping said electric motor energized after the outermost turn of said coil spring moves inwardly out of contact with said microswitch, and a time delay switch which opens said electrical circuit after a predetermined period of time to disconnect said battery and thereby terminate the winding of said coil spring by said motor, and
means for releasing said brake means to enable said main drive gear to be driven by the energy stored in said coil spring.

3,960,247
MOTION DAMPER

Donald F. Wilkes, Albuquerque, N. Mex., assignor to Hosmer/-Dorrance Corporation, Campbell, Calif.

Filed June 20, 1975, Ser. No. 588,626
Int. Cl.² F16F 7/06
U.S. Cl. 188—1 B 26 Claims



1. A motion dampening system comprising:
a movable body whose motion is to be dampened;
a guide surface arrangement including a pair of guide surfaces;
a damper roller arrangement including a pair of rollers mounted for free rotation about axes that are in fixed spaced relation to one another, said rollers each having resilient peripheral surfaces;

said body being connected to one of said guide surface arrangement and said roller arrangement;

means responsive to the application of a motion-inducing force to said body for moving said body relative to the other of said guide surface arrangement and said roller arrangement, and simultaneously urging each guide surface and the resilient periphery of an associated roller into compressive engagement at an intensity which progresses in relation to the magnitude of said motion-inducing force as said rollers rotatingly engage said guide surfaces, to retard motion of said body.

3,960,248

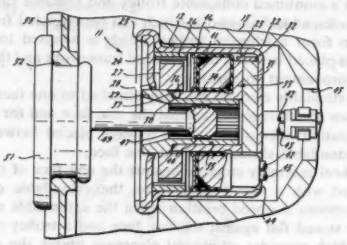
SPEED SENSING DEVICE

Leonard T. Tribe, Ann Arbor, Mich., assignor to Kelsey-Hayes Company, Romulus, Mich.

Filed July 16, 1975, Ser. No. 596,400

Int. Cl.² B60T 8/02

U.S. Cl. 188—181 R **15 Claims**



1. A speed sensing device for a wheeled vehicle or the like and adapted to be fitted in a cavity at the outer end of an axle, said speed sensing device comprising an outer housing adapted to be supported at least in part in the axle cavity, a stator carried by said housing, a rotor journaled in said housing for rotation relative to said stator, electromagnetic means for providing an electronic signal indicative of speed upon relative rotation between said rotor and said stator, and splines formed on said rotor for providing a sliding drive connection from the associated wheel to said rotor for driving said rotor in timed relation to the wheel and for permitting axial variations in spacing between the wheel and axle without exerting axial forces on said rotor.

3,960,249

VEHICLE RETARDERS

Walter Robert Stirling, Buxton, England, assignor to Ferodo Limited, Manchester, England

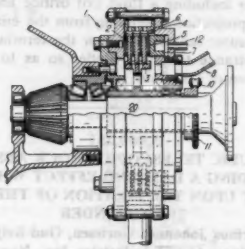
Continuation of Ser. No. 58,940, July 28, 1970, abandoned. This application Apr. 17, 1972, Ser. No. 244,914

Claims priority, application United Kingdom, July 29, 1969, 38077/69

Int. Cl.² F16D 65/853

U.S. Cl. 188—264 F **5 Claims**

1. In a vehicle retarder system comprising a frictional retarder including hydraulic pressure-operated control means for controlling the retarding torque applied by said retarder and circulating means for circulating cooling liquid through said retarder, the improvement wherein said circulating means comprises a positive displacement pump having an outlet, means operatively connecting said pump to said vehicle for operation at a speed directly related to the speed of said vehicle, means including an adjustable throttle valve connecting said outlet with said retarder, said throttle valve controlling the resistance to flow of said cooling liquid from said pump to said retarder wherein the opening of said throttle valve is not responsive to changes in pressure of the cooling liquid whereby the delivery pressure of said cooling liquid from said pump upstream of said throttle valve is controlled, said throttle valve including means preventing total closure thereof, and means connecting said pump outlet upstream of said throttle valve with said control means, said control means being responsive to the pressure differential between the pressure of said cooling liquid in said retarder downstream of said throttle valve and the pressure in said control means,



whereby when said throttle valve is fully opened, said pressure differential is such that said control means causes said retarder to be inoperative, but when said throttle valve is partially closed and throttles said flow of cooling liquid to said retarder, said pressure differential is dependent on the speed of said pump and hence on the speed of said vehicle, thereby increasing said retarding torque as said vehicle speed is increased.

3,960,250

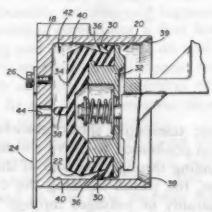
SKIRTED DASHPOT PISTON

Kenneth Walter Wiater, Palatine, Ill., assignor to Teletype Corporation, Skokie, Ill.

Filed Apr. 14, 1975, Ser. No. 567,976

Int. Cl.³ F16F 9/48

U.S. Cl. 188—281 **2 Claims**



1. An apparatus for damping the return shock between a pair of first and second elements that are moved out of engagement and returned into engagement comprising:

a dash pot cylinder carried on the first element having an internal cylindrical surface of a predetermined diameter,

a dash pot piston on said second element having an annular sealing member projecting in a cantilever fashion generally outwardly from said piston and toward said cylinder, said sealing member displaying a first surface toward said cylinder,

said cylinder defining an outwardly tapered camming surface continuous with the inner surface of said cylinder and extending outwardly therefrom and disposed toward said piston sealing member, the maximum diameter of said tapered surface being more than the maximum diameter of said sealing member so as to facilitate entrance of said piston into said cylinder and serving to cam said piston and cylinder into mutual axial alignment,

said sealing member being constructed of a material exhibiting sufficient rigidity to retain said cantilever portion

relatively close to the sides of said piston and exhibiting sufficient flexibility to permit entrance of said sealing member into said cylinder and deflect outwardly so as to seal a gap between the piston and the cylinder,

said cylinder containing an operative fluid reacting upon said sealing member first surface to force said cantilever portion away from said piston thereby insuring contact of said sealing member with the walls of said cylinder,

said cylinder including a fluid exit orifice and said piston having a projection extending from the end thereof oriented to enter said orifice near the terminal end of the piston entrance to said cylinder so as to increase the constriction of said fluid.

3,960,251

HYDRAULIC TELESCOPIC SHOCK ABSORBER PROVIDING A DAMPING EFFECT WHICH IS DEPENDENT UPON THE POSITION OF THE PISTON IN THE CYLINDER

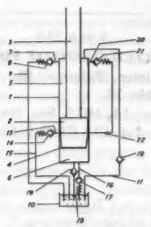
Adrianus Marinus Johannes Gorissen, Oud-Beijerland, Netherlands, assignor to ITT Industries, Inc., New York, N.Y.

Continuation of Ser. No. 497,889, Aug. 16, 1974, abandoned. This application July 31, 1975, Ser. No. 600,287

Claims priority, application Netherlands, Aug. 20, 1973, 7311434

Int. Cl.² F16F 9/48

U.S. Cl. 188—286 **6 Claims**



1. A hydraulic telescopic shock absorber comprising a cylinder, a piston positioned to move within said cylinder, a piston rod extending through one end of the cylinder to engage said piston, the piston dividing the cylinder into two chambers, a plurality of passages through the walls of the cylinder, conduits coupled to a plurality of the passages to permit the flow of dampening fluid between the cylinder chambers, conduits coupled to a plurality of the passages to permit the flow of dampening fluid between the cylinder chambers and a dampening fluid reservoir, valve means in said conduits for effecting dampening forces during strokes of the piston, the passages being positioned in such a way that during at least a portion of an in-going stroke as well as during at least a portion of an out-going stroke of the piston at least one communication of the passages with the cylinder is closed by the piston to increase the dampening effect of the shock absorber, and including an arrangement such that during a complete in-going stroke as well as during a complete out-going stroke at least two valve means operate successively, that during the last portion of the in-going stroke valve means having the lowest resistance that is effective during said stroke is put out of action by the piston while valve means having a higher resistance is put into action and that during the first portion of the out-going stroke valve means having the lowest resistance that is effective during said stroke is kept out of action by the piston while valve means having the higher resistance is kept in action.

3,960,252

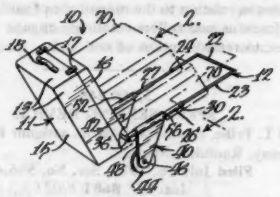
COLLAPSIBLE TROLLEY AND PORTABLE CASE

Khalil Ahmad Ibrahim Cassimally, 210-Third St. West, Roundup, Mont. 59072

Filed May 31, 1974, Ser. No. 474,546

Int. Cl.² B65D 5/14

U.S. Cl. 190—18 A **16 Claims**



1. In a combined collapsible trolley and portable case having a collapsible framework which can be extended from the case to form a wheeled trolley which is adapted to retain luggage placed between the extended framework and the case, the improvement comprising:

an extendable element pivotally attached to one face of the case for storage flat against the one face and for pivotal rotation outward to retain luggage placed between the extendable element and the one face,

a wheel assembly storable against the one face of the case and with a sleeve slidable on the extendable element between a stored position when the extendable element is stored flat against the one face and a trolley position which provides additional clearnace above the ground, and

a recess located on the one face for storing the wheel assembly and the entire collapsible framework.

3,960,253

POSITIVE ENGAGEMENT CLUTCH

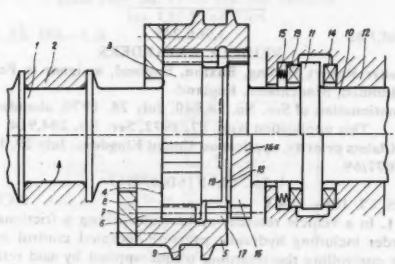
Hans Sigg, Mutschellen, Switzerland, assignor to Maag Gear-Wheel & Machine Company Limited, Zurich, Switzerland

Filed Feb. 28, 1974, Ser. No. 447,018

Claims priority, application Switzerland, Mar. 2, 1973, 3080/73

Int. Cl.² F16D 13/22, 43/00

U.S. Cl. 192—67 A **9 Claims**



1. A positive engagement clutch comprising co-axial first and second shafts displaceable axially relative to each other and an intermediate member displaceable axially of said shafts to connect and disconnect them, first and second series of teeth on the intermediate member, teeth on the first shaft maintained in engagement with said first series of teeth of the intermediate member, teeth on the second shaft being engageable and disengageable with said second series of teeth of the intermediate member as a result of said axial displacement of

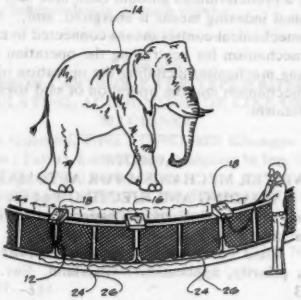
the member to drivingly connect and disconnect the first and second shafts, respective elements of a first pair of co-operating abutment elements on said intermediate member and said first shaft to limit movement of said intermediate member relative to said first shaft, said second series of teeth of the intermediate member being of helical formation such that, dependent upon the torque applied to said clutch with said second series of tetth of said intermediate member engaging the teeth of said second shaft, an axial force is generated by said torque to act between said helical series of teeth and the engaged teeth of said second shaft to urge them further into engagement, a second pair of co-operating abutment elements between the shafts being brought into engagement by a relative displacement of the shafts caused by said axial force to lock the shafts together against said axial force.

3,960,254

AUDIO INFORMATION DEVICE

Ronald Augustine Fial, Milwaukie, and Hal Markowtiz, Portland, both of Oreg., assignors to Portland Zoological Society, Portland, Oreg.

Filed Apr. 3, 1975, Ser. No. 564,634
Int. Cl.² G07F 5/10
U.S. Cl. 194—9 T **4 Claims**



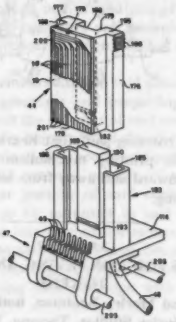
1. An audio information device comprising: a recording tape play back unit adapted to play a tape having messages and start-stop signals recorded thereon, said start-stop signals indicating the beginning and end of the messages, a read out head in said play back unit adapted to read off the messages and start-stop signals recorded on the recording tape, a multiple of control units electronically connected to the read out head to receive the messages and start-stop signals on the tape, an audio receiver electronically connected to each control unit and each control unit including transmission control means to connect and disconnect the transmission of the messages being received from the play back unit to the audio receiver, and a switch electronically connected to each control unit that is available to a user of the device to signal the control unit to transmit said messages, and said transmission control means of each control unit being responsive to the sequential transmit signal received from the switch and the start signal received from the play back unit to connect transmission of the messages to the audio receiver, and said transmission control means of each control unit being subsequently responsive to the stop signals received from the play back unit to disconnect the transmission of the messages to the audio receiver, said transmission of the messages and start-stop signals from the play back unit to the control units being continuous during the connect and disconnect operations of the transmission control means of any one control unit whereby the control units connected to the play back unit can operate independent of each other.

3,960,255

MOUNTING MECHANISM FOR A NON-IMPACT DOTS-MATRIX PRINT HEAD

Flavio Bisson, Montalto Dora (Turin), and Armando Aprato, Lugnacco (Turin), both of Italy, assignors to Ing. C. Olivetti & C., S.p.A., Ivrea (Turin), Italy

Filed Dec. 10, 1974, Ser. No. 531,256
Claims priority, application Italy, May 10, 1974, 68469/74
Int. Cl.² G01D 15/10
U.S. Cl. 197—1 R **6 Claims**



1. In a non-impact printer of the type having a planar print head carrying on plane surface thereof a plurality of printing elements and a pattern of conductors for selectively effecting energization of said printing elements, a support member having a first planar surface upon which head is fixed and a base member upon which this support is mounted, the improvement comprising:

guide means defining a rectilinear slide path along which said support member is slidably movable with respect to said base member between a free position and a working position wherein said print head is operable;

means for releasably latching said support member in said working position comprising a first latch member disposed along said slide path and on said base member, a second latch member on said support member and cooperative with said first latch member when in a latching position to fix said support member along said slide path with respect to said base member;

biasing means for biasing said second latch member into said latching position when said support member is moved into said working position; and

means disposed on said base member for preventing any movement of said support in a direction perpendicular to the surface of said head and to the rectilinear guide path, whereby the head is fixed with respect to any pressure which is exerted onto the plane surface of the head during the printing operation.

3,960,256

ADJUSTABLE CARRIAGE APPARATUS

Charles Bickoff, Acton, and St. John Merrill Hall, Jr., Sharon, both of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Oct. 21, 1974, Ser. No. 516,513
Int. Cl.² B41J 3/04
U.S. Cl. 197—1 R **12 Claims**

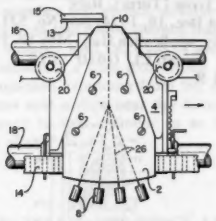
1. Apparatus for supporting a printing mechanism adjacent to the paper being printed upon, said apparatus comprising:

A. movable carriage means supporting said printing mechanism, said carriage means having at least one first bore extending substantially parallel to said paper;

B. at least one first bearing member rotatably located in said first bore, said first bearing member containing a second

bore whose center-line is substantially parallel to and offset from said first bore's center line;

C. a first shaft, fixed with respect to said paper, closely fitting within said second bore; and



D. means for rotating said first bearing about said shaft, whereby said printing mechanism may be selectively positioned toward and away from said paper by rotation of said bearing.

3,960,257

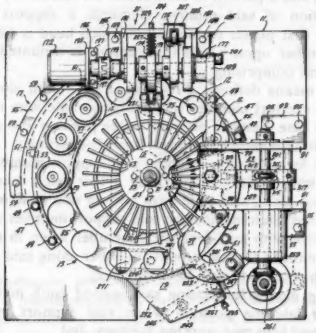
APPARATUS FOR CONVEYING AND ENGRAVING TOKENS

Cliff R. High, and Morley Brotman, both of Tacoma, Wash., assignors to Morley Studios, Tacoma, Wash.

Filed Apr. 26, 1974, Ser. No. 464,649

Int. Cl.[2] B41J *1/30*; B41F *17/36*

U.S. Cl. 197—6.7 **17 Claims**



1. A token engraving apparatus for selectively engraving a sequence of characters onto the surface of a token, said token engraving apparatus comprising:

a multiple apertured turret mechanism suitable for supporting a plurality of tokens in a plurality of apertures and moving said plurality of tokens sequentially along a generally horizontal path of travel through a token supply station, a token engraving station and a token ejecting station, said multiple apertured turret mechanism comprising a flat, ring-shaped plate movable about a turret axis centrally located with respect to said flat ring-shaped plate;

a token supply mechanism located at said token supply station for supplying tokens downwardly, under the force of gravity, such that said tokens fall sequentially into said plurality of apertures in said multiple apertured turret mechanism;

a printing mechanism suitable for selectively positioning character type at said engraving station in a manner such that said character type can be pressed into a surface of tokens located at said engraving station in a sequential manner so as to engrave a selective sequence of characters therein, said printing mechanism comprising a printing head having a generally circular outer periphery and suitable for rotation about a print axis, said character type being located about the outer periphery of said print head and said print axis being located inside of said ring-shaped plate forming said multiple apertured turret mechanism, but offset with respect to said turret axis, said print head being rotatable independently of movement of said multiple apertured turret mechanism;

a locking mechanism suitable for locking said print head in position during the period of time that a character type is being pressed into a surface of a token located at said engraving station;

an engraving mechanism located at said token engraving station for pressing type brought to said station by said print head into engraving contact with a surface of a token located at said engraving station;

token indexing mechanism lcoated at said engraving station for indexing a token located at said engraving station subsequent to a character being engraved therein;

an ejection mechanism located at said ejection station for ejecting tokens downwardly from said ring-shaped plate forming said multiple apertured turret mechanism subsequent to said tokens being engraved at said engraving station;

electromechanical indexing means mechanically connected to said ring-shaped plate for indexing said ring-shaped plate a predetermined amount each time said electromechanical indexing means is energized; and,

electromechanical control means connected to said engraving mechanism for controlling the operation of said engraving mechanism including the operation of said locking mechanism and the operation of said token indexing mechanism.

3,960,258

TYPEWRITER MECHANISM FOR AUTOMATICALLY LOADING AND EJECTING PAPER

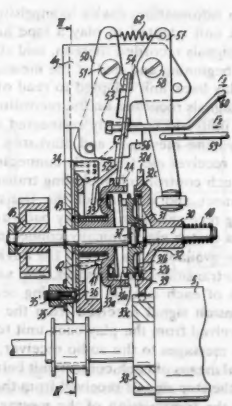
Otto Aebi, Yverdon, Switzerland, assignor to Hermes Precisa International S.A., Yverdon, Switzerland

Filed Nov. 20, 1974, Ser. No. 525,627

Claims priority, application Switzerland, Nov. 22, 1973, 16451/73

Int. Cl.[2] B41J *13/03*

U.S. Cl. 197—127 R **11 Claims**



11. In a mechanism for automatically loading paper into and ejecting paper from a typewriter, said typewriter having an electric motor, a platen, means for rotating said platen, adjusting means under control of the typist for setting the amount of angular movement of said platen depending on the length

of paper that is to be loaded into the typewriter, and a paper bail, the improvement wherein said means for rotating said platen comprises a first control means for continuously rotating said platen to eject paper from the typewriter, and a second control means for rotating said platen for a limited period of time depending on the setting of said adjusting means so as to automatically introduce the desired length of paper into the typewriter for typing, means cooperating with said second control means and controlled thereby for opening said paper bail whenever said second control means is operative, actuating means for selectively rendering said first or second control means operative, said means for rotating said platen further including first toothed wheel means, a rotatable shaft on which said first toothed wheel means is rotationally rigidly mounted, said electric motor including a drive shaft, means for drivingly coupling said drive shaft to said rotatable shaft to rotate the latter whenever said first or second control means is operative, said first control means including second toothed wheel means, said second control means including third toothed wheel means, said first control means including connecting means for meshing said first and second toothed wheel means whenever said first control means is operative, said second control means including connecting means for meshing said first, second and third toothed wheel means whenever said second control means is operative, said second toothed wheel means being drivingly connected to said platen to rotate the latter, said first and second control means capable of functioning independently of each other.

3,960,259

RIBBON CARTRIDGE FOR TYPEWRITER, CALCULATING, ACCOUNTING OR LIKE OFFICE MACHINES

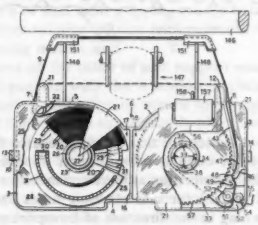
Gian Paolo Guerrini, Ivrea (Turin), and Giuseppe Oddicini, Banchette (Turin), both of Italy, assignors to Ing. C. Olivetti & C., S.p.A., Ivrea (Turin), Italy

Continuation-in-part of Ser. No. 292,597, Sept. 27, 1972, Pat. No. 3,877,561. This application Aug. 23, 1974, Ser. No. 499,964

Claims priority, application Italy, Oct. 4, 1971, 70243/71

Int. Cl.[2] B41J *33/14*

U.S. Cl. 197—151 **3 Claims**



1. A ribbon cartridge removably mountable on a feed device of a typewriter, calculating machine, accounting machine or other office machines having a platen, a type head opposite said platen and carrying a plurality of characters, a support opposite said head for mounting said cartridge and a ribbon lift guide including a pair of supports embracing the type head and located between the platen and type head for guiding the ribbon in front of a typing point of said platen, said supports being spaced a predetermined distance therebetween, and a manually operable member for lifting the ribbon guide,

said ribbon cartridge comprising:

a single container having substantially parallelepipedal configuration having a top portion, a rear portion and two lateral portions;

a pair of rotatable spools having a ribbon wound thereon;

means for rotatably mounting said pair of spools in said container at a reciprocally fixed distance; and

means for guiding the portion of said ribbon external to said container to space said portion of said ribbon from the rear portion of said container and enabling said external portion of said ribbon to be further spaced from said rear portion when engaged with the ribbon lift guide in the lifted position thereof, the guide means comprising

means defining a pair of apertures in said rear portion adjacent to said lateral portions, a part of said ribbon extending through one of said pair of apertures to the external of said container and returning into the interior of said container through other of said pair of apertures and

a pair of arm members fixed to said container adjacent to said pair of apertures and projecting from said rear portion towards the exterior of said container, said pair of arm members being spaced therebetween more than the predetermined distance of said pair of supports and supporting said external portion of said ribbon away from said rear portion of said container when said container is to be mounted in said feed device for facilitating the insertion or the removal of said ribbon with respect to said pair of supports of said lift ribbon guide by only moving the single container upon mounting or removing said cartridge with respect to said support.

3,960,260

APPARATUS FOR AND METHOD OF CONVEYING AND HANDLING TIRE BEAD WIRES

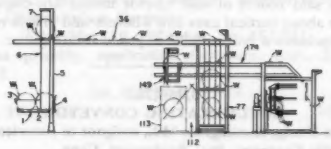
Tosio Azuma, Higashimurayama, and Hisashi Yonekawa, Kuroiso, both of Japan, assignors to Bridgestone Tire Company Limited, Kyoba, Japan

Filed Aug. 7, 1975, Ser. No. 602,741

Claims priority, application Japan, Aug. 8, 1974, 49-91018

Int. Cl.[2] B65G *47/00*

U.S. Cl. 198—19 **16 Claims**

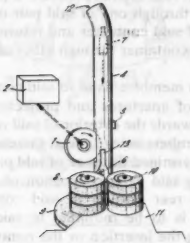


16. A method of conveying and handling a tire bead wire, comprising transferring said tire bead wire one by one from a tire bead wire waiting position to a first conveyor mechanism disposed above said tire bead wire waiting position, temporally stopping said tire bead wire on said feed conveyor mechanism for adjusting the timing of feeding said tire bead wire to a following process, transferring said tire bead wire on said first conveyor mechanism to a gripping position, holding said tire bead wire conveyed to the gripping position and transferring it to a receiving portion of a tire bead wire working machine for appropriately working said tire bead wire, receiving said tire bead wire from said working machine and transferring it to a second conveyor mechanism, conveying said tire bead wire to the end of said second conveyor mechanism by intermittently driving said second conveyor mechanism, collecting a predetermined number of tire bead wires conveyed to the end of said second conveyor mechanism onto a collector actuating correspondingly to said second conveyor mechanism, and carrying said tire bead wires collected on said collector to a following process.

3,960,261
APPARATUS FOR CONVEYING ARTICLES

Tore Planke, 3180 Nykirke, Norway

Filed Aug. 12, 1974, Ser. No. 496,613
Claims priority, application Norway, Aug. 14, 1973, 3232/73
Int. Cl.² B65G 47/00
U.S. Cl. 198—26 5 Claims



1. Apparatus for conveying articles of different physical characteristics comprising, in combination, tubular guide means for guiding said articles along a path, speed, retarding means disposed to act upon articles passing through said tubular guide means for reducing the speed of said articles, article receiving means, shock absorbing means associated with said said article receiving means for absorbing shock from articles delivered to said article receiving means, and ejector means for receiving articles from said shock absorbing means and feeding said articles to an article receiving station, wherein said speed retarding means comprises a rotating roller formed of a porous resilient material and having a surface with a high friction coefficient, said roller projecting into said tubular guide means, and speed regulating means connected to said rotating roller, and wherein said article receiving means includes a conveyor belt, said ejector means comprising a pair of coacting rotating rollers, said rollers being formed with a resilient surface having a high coefficient of friction and wherein said rollers of said ejector means are disposed for rotation about vertical axes and wherein said article receiving means includes a horizontally disposed rotating disc.

3,960,262
ACCUMULATING CONVEYOR

Seymour Henig, Kensington, Md., assignor to American Chain & Cable Company, Inc., Bridgeport, Conn.

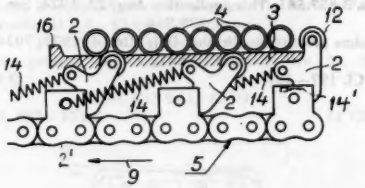
Filed Nov. 29, 1974, Ser. No. 528,214
Int. Cl.² B65G 13/02
U.S. Cl. 198—127 R 29 Claims

1. In a roller conveyor, the combination comprising
a plurality of transversely extending rollers,
means for rotatably supporting said rollers in parallel longitudinally spaced transversely extending relation to one another,
endless chain means for engaging at least some of said rollers and rotating said rollers,
said rollers comprising a first tail end section comprising a plurality of said rollers,
a second accumulating section comprising a plurality of rollers,
and a third drive section comprising a plurality of rollers,
at least some of said rollers in said accumulating section including a self-energizing clutch associated therewith including an input member rotatable about the axis of the roller and driven by said chain means, an output member fixed to said roller, and spring means normally interengaging said input and output members and actuatable to disengage the input and output members,
a sensor projecting upwardly normally into the path of an article moving along said rollers in said accumulating section,
said sensor being movable downwardly upon movement of an article thereover,
and means mechanically connected to said clutches and operable upon depression of said sensor directly to engage said spring means and to cause disengagement of said clutches.

3,960,263
TRANSPORT DEVICE FOR REACTOR FUEL ROD CLADDING TUBES

Conny Isaksson, Vallingby; Lars-Erik Nordin, Taby; Curt Olsson, Bandhagen, and Thorbjorn Sahlin, Vasteras, all of Sweden, assignors to Aktiebolaget ASEA-ATOM, Vasteras, Sweden

Filed Dec. 24, 1974, Ser. No. 536,230
Claims priority, application Sweden, Dec. 31, 1973, 7317617
Int. Cl.² B65G 19/00
U.S. Cl. 198—170 3 Claims

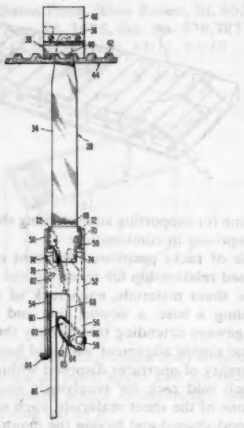


1. Transport device for transporting reactor fuel rod cladding tubes (4) of circular cross-section transversely along a production line, comprising at least one member (3) provided with a travel surface for said cladding tubes and a transport chain (5) running in the direction of transport and parallel to the travel surface, said transport chain (5) having a plurality of carriers arranged one after the other in the direction of transportation, each carrier comprising a carrier arm (2) which is attached by its inner end to the transport chain (5) and which is rotatable around a shaft (2') directed transversely to the chain; and spring means for keeping the carrier arm (2) in gripping position at least as long as the carrier arm is only affected by the spring means, said spring means including means to exert a force of such a value that the carrier arm by contact with a movable group of tubes arranged adjacent to each other on the travel surface and of a number greater than a predetermined number is turned so far back that its carrier effect ceases, and of such a value that the carrier arm (2) after having passed all of said group of tubes with the exception of such predetermined number of tubes in front of the carrier is pulled by the spring means (14) into a gripping position between two cladding tubes of said group.

3,960,264
ITEM TRANSPORT APPARATUS

Joseph C. Carbine, Wyncote, and Robert S. Bradshaw, Broomall, both of Pa., assignors to Burroughs Corporation, Detroit, Mich.

Filed Jan. 28, 1975, Ser. No. 544,926
Int. Cl.² B65G 17/12
U.S. Cl. 198—179 7 Claims



1. A carrier mechanism for transporting objects such as mail items from place to place for disposition at an intermediate or ultimate distination comprising,

an irregularly shaped member having transport engaging means at one end thereof and object engaging means at the opposite end thereof,

said object engaging means including oppositely disposed orthogonally arranged pivot support means and a backup anvil adjacent one of said support means,

a plurality of item gripping (means) levers having a resilient surface portion disposed on (one of) said support means movable into and out of engagement with an item disposed between said item gripping means and said backup anvil, each of said item gripping means being capable of independent relative motion with respect to the other of said gripping means, and

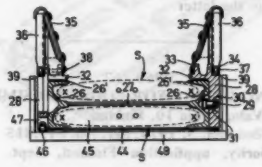
release means on the other of said support means including means engagable with the transport apparatus for resiliently causing said gripping means to engage an item for transport thereby and subsequently to release said item at the intermediate or ultimate destination thereof, said item gripping means being capable of relative movement with respect to said item whereby any pendulum tilt or rocking movement of said item causes one of said gripping means to hold said item while the item moves with respect to the other of said gripping means so that the (latter) item (to further engage) moves into tighter engagement with said gripping means.

3,960,265
MINING INSTALLATIONS

Helmut Temme, Waltrop; Werner Hageneier, Altlunen, and Hans-Dieter Schneider, Lunen, all of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Westfalia, Germany

Filed Jan. 16, 1975, Ser. No. 541,553
Claims priority, application Germany, Jan. 16, 1974, 2401833
Int. Cl.² B65G 15/60
U.S. Cl. 198—204 7 Claims

3. For use in a mineral mining installation the combination of a scraper-chain conveyor and a shifting apparatus for displacing the conveyor longitudinally; the conveyor comprising a series of channel sections arranged end-to-end, each channel section being composed of two side walls each with a generally sigma-shaped cross-section and a floor connected between the walls, a scraper-chain assembly for movement along the channel sections to effect transference of material and reinforcement means for the channel sections, said reinforcement means being in the form of stiffening members attached to the exteriors of the side walls of each channel section, each stiffening member having an L-shaped profile in cross-section with a main portion substantially covering the exterior of the associated channel section side wall and a further portion

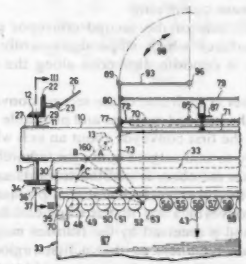


extending over said side wall, the upper side of said further portion of each stiffening member being provided with at least two upstanding webs serving to receive and connect with further plates which extend upwardly beyond the side walls of the channel sections and are inclined away from the longitudinal center of the conveyor in a vertical direction when installed whereby to increase the capacity of the conveyor, coupling means interconnecting the stiffening members and supports for the further plates, said supports being located outwardly of the further plates relative to the longitudinal center of the conveyor and spaced apart longitudinally of the conveyor, the supports being engaged on and connected to the further portions of the stiffening members.

3,960,266
APPARATUS FOR SIMULTANEOUSLY TRANSFERRING A PLURALITY OF ARTICLES FROM ONE CONVEYOR TO ANOTHER

Kurt Becker, Obernkirchen, Germany, assignor to Hermann Heye, Obernkirchen, Germany

Filed Mar. 19, 1974, Ser. No. 452,551
Claims priority, application Germany, Apr. 3, 1973, 2316467
Int. Cl.² B65G 47/24
U.S. Cl. 198—235 10 Claims



1. An apparatus for simultaneously transferring a plurality of articles from one position in which they travel on a first conveyor is a first direction to another position in which they travel on a second conveyor at a slower speed in a second direction transversely of said first direction, said apparatus comprising a frame; pusher means including an elongated pusher bar extending parallel to said first direction; mounting

means, including mounting links spaced from each other in siad first direction and each having a first portion pivotally connected to said pusher means and a second portion spaced from said first portion and directly pivotally connected to said frame, said mounting links being operative for pivotally mounting said pusher means on said frame for displacement across said first conveyor toward said second conveyor in a direction having one component of movement in said second direction and another superimposed component of movement in said first direction; a crank drive mounted on said frame and spaced from said pusher means; and connecting means including a connecting rod actuated by said crank drive and so connected with one of said mounting and pusher means as to include an angle with said mounting links in all of its positions relative to the latter.

3,960,267

TURNING DEVICE FOR LOGS AND SIMILAR

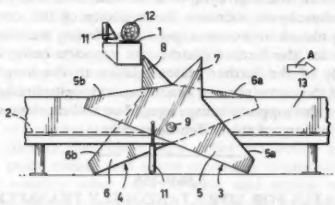
Antti Tapani Valo, Lohja 10, Finland

Filed Oct. 3, 1974, Ser. No. 511,815

Claims priority, application Finland, Sept. 18, 1974, 2721/74

Int. Cl.² B65G *47/24*

U.S. Cl. 198—278 **6 Claims**



1. Apparatus for transporting logs, comprising a first longitudinal conveyor, a second longitudinal conveyor positioned underneath and transversely to said first conveyor, and transfer means for receiving a log displaced transversely from the first conveyor and transferring it onto said second conveyor, said transfer means comprising:

means at each side of the second conveyor defining two inclined surfaces which slope downwardly away from each other in opposite directions along the second conveyor; and

a guide member at each side of the second conveyor extending above the inclined surfaces and pivotable towards and away from the first conveyor about an axis which extends transversely to said second conveyor, whereby when one of said guide members is pivoted towards said first conveyor and the other guide member is pivoted away from said first conveyor a log that is displaced from the first conveyor and is received by the transfer means is guided by the guide members so that a first region of the log engages that inclined surface on one side of the second conveyor which slopes in the direction of movement of the second conveyor and a second region of the log engages that inclined surface on the other side of the conveyor which slopes in the opposite direction, and the log slides down the inclined surfaces which it engages and is finally received on the second conveyor with said first region of the log leading the second region of the log in the direction of movement of the second conveyor.

3,960,268

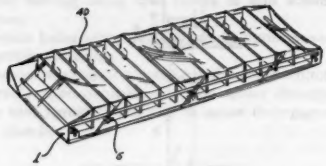
FRAME FOR SUPPORTING FRANGIBLE SHEET MATERIALS

Richard W. Davis, Tempe, and Thomas L. Muir, Phoenix, both of Ariz., assignors to Villa Precision, Inc., Phoenix, Ariz.

Filed Sept. 15, 1975, Ser. No. 613,359

Int. Cl.² B65D *75/30, 65/38, 85/48;* **A47G** *29/00*

U.S. Cl. 206—45.33 **14 Claims**



1. A frame for supporting and retaining sheet materials, said frame comprising in combination:

a. a pair of racks positioned adjacent one another in an opposed relationship for receiving and engaging portions of the sheet materials, each rack of said pair of racks including a base, a sloping side and at least a pair of passageways extending transversely through said rack in general planar alignment with said base;

b. a plurality of apertures disposed within said sloping side of each said rack for receivingly engaging penetrating portions of the sheet materials, each said aperture being diamond shaped and having the major axis transverse to said rack and the minor axis in general alignment with said rack;

c. at least two rods for interconnecting said racks of said pair of racks and maintaining said racks spaced apart from one another with the sloping sides thereof facing one another, each of said rods engaging a passageway within each of said racks; and

d. interference means disposed intermediate said rods and the respective ones of said passageways for establishing an interference fit therebetween to restrain inadvertent change in spacing intermediate said racks of said pair of racks.

12. The frame as set forth in claim 1 including a removable envelope for sealingly enclosing said frame and the sheet materials mounted thereon.

3,960,269

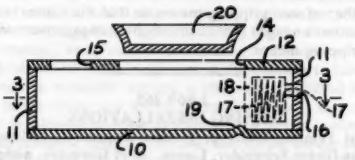
COMBINATION ASH TRAY AND CHEWED GUM DISPOSAL PACKAGE

Garry W. Jenkins, 4218 Lewis St., P.O. Box 777, Oceanside, Calif. 92054

Filed Apr. 7, 1975, Ser. No. 565,817

Int. Cl.² A45C *11/00;* **B65D** *85/67*

U.S. Cl. 206—233 **2 Claims**



1. A combination ash tray and chewed gum disposal package which comprises a receptacle defined by a bottom plate, a top plate and a peripheral side wall, said top plate having a relatively small opening therethrough to receive wrapped gum to be deposited in the receptacle, said top plate also having a relatively large opening therethrough for discharging wrapped gum from the receptacle interior, and a removable ash tray

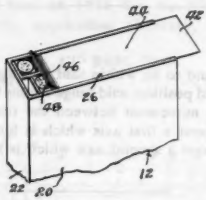
fitting in said large opening to serve as a closure and shield the wrapped gum from view, said large opening being spaced from the front face of the side wall to provide an interior area at the front of the receptacle to receive a tissue supply, said front face having a slot therethrough for withdrawal of tissue.

3,960,270

CIGARETTE CASE

Bob May, 414 Clinton Place, River Forest, Ill. 60305

Filed Apr. 23, 1975, Ser. No. 570,787
Int. Cl.² B65D *1/24, 43/12, 85/10*
U.S. Cl. 206—256 **4 Claims**



1. A cigarette case including a case body defining an interior space and having an open upper end for receiving cigarettes of predetermined length therethrough into the case body and withdrawing out of it,

the case body having a length equivalent to the length of the cigarettes, a width less than the length, and a thickness substantially equivalent to the thickness of two cigarettes fitted side-by-side,

an insert in the case body and including a central wall dimensioned substantially equivalent to the length and width of the case body, and side vanes extending laterally from each of opposite sides of the central wall, the side vanes being spaced apart in the direction of the width of the central wall and extending longitudinally in the direction of the length thereof, and terminating at the open upper end of the case body, the side vanes and central wall defining cells between adjacent side vanes, and the cells thereby terminating at the open upper end of the case body, and

a closure member mounted in the case body in position closing the open upper end thereof and slidable therein in the direction of the width of the case body for sequentially exposing cigarettes which are in the cells to the open upper end, the closure member being so positioned in the case body and the case being otherwise so dimensioned and proportioned that the closure member when in closing position is effective for confining cigarettes in the case against movement lengthwise but without compacting them.

3,960,271

CARRYING CASE FOR DARTS

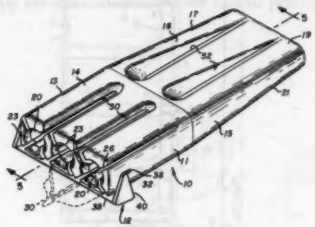
Thomas N. Nelson, 443 Avenida Del Roble, San Jose, Calif. 95123

Filed Feb. 21, 1975, Ser. No. 551,596
Int. Cl.² B65D *85/00;* **A63D** *65/02;* **B65D** *43/16*
U.S. Cl. 206—315 R **6 Claims**

1. A carrying case for darts, comprising:

an elongated unitary body including a plurality of parallel, spaced apart bores extending through the top surface of said body longitudinally thereinto to form dart receiving chambers, diagonal slots extending radially from said bores along a portion of the length thereof to form dart feathers receiving passages, and longitudinally extending elongated pivot slots formed in opposite side walls of said body proximate said top surface, said pivot slots each having an upper recess and a lower recess formed in spaced apart relationship along the length thereof; and

a closure member including a rotatable into portion slightly longer than the width of said body and a pair of side portions extending from the ends thereof normal to said cover portion, said side portions each having a pivot tab extending inwardly toward the opposite side portion, said



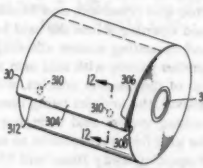
tabs being received by said pivot slots and moveable from engagement with one of said recesses along the slot and into engagement with the other recess, said closure member being rotatableinto a bore exposing position when said tabs are in engagement with said upper recesses and being locked in a bore closing position when said tabs are in engagement with said lower recesses.

3,960,272

ROLL PRODUCT WITH MANUALLY GRASPABLE TAIL END AND MANUFACTURE THEREOF

Ellsworth A. Hartbauer, Concord, and Henry W. Rehr, Clayton, both of Calif., assignors to Crown Zellerbach Corporation, San Francisco, Calif.

Division of Ser. No. 476,017, June 3, 1974. This application May 5, 1975, Ser. No. 574,843
Int. Cl.² B65D *85/67*
U.S. Cl. 206—389 **21 Claims**



15. A roll product comprising:

an elongated sheet of flexible material wound to provide a plurality of convolutions and having a tail portion;

a fold formed at the end of said tail portion, said fold comprising at least two tail portion segments connected along a fold line and disposed in substantially parallel relationship with one of said segments terminating with a free end, said fold being in abutting engagement with an underlying convolution of said sheet material and said roll product terminating at said fold line; and

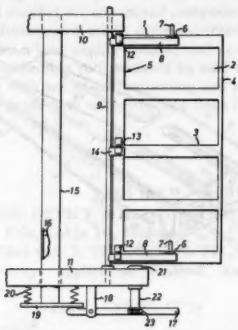
means releasably securing said fold to said underlying convolution, said releasably secured fold being adapted for manual grasping by the user of the roll product whereby release of said secured fold and unwinding of said roll product are facilitated.

3,960,273

DISPLAY DEVICE

Roy Bernard Weston, 9 Dingle Dell, Leighton Buzzard, England

Filed Feb. 14, 1975, Ser. No. 550,880
Int. Cl.² E05B 73/00; A47F 5/12
U.S. Cl. 211—4 6 Claims



1. A display device comprising a vertically disposed wing-like member for receiving articles to be displayed; an arm; a vertically disposed rod to which the arm is fixed by one end; a pin extending vertically from the other end of the arm; means cooperating with said pin and pivotally mounting the wing-like member on said arm about a first axis which is provided by said pin and which is substantially parallel to the plane of said wing-like member; means mounting said rod for rotary movement enabling pivoting said arm about a further axis which is an axis of said rod and which is parallel to said first axis; releasable locking means comprising a hook formation provided on the wing-like member at a region thereof close to the rod, the hook formation cooperating with a portion of the arm, to maintain said wing-like member fixed relative to said arm, the action of the locking means being releasable by lifting the wing-like member to an extent sufficient to clear the hook formation from the arm, while maintaining the engagement of the wing-like member with said pin; said wing-like member being in the form of a frame structure with means defining an opening through which the said articles can be inserted and removed; and blocking means effectively blocking said opening when the said locking means are operative, said rod mounting means allowing swinging of the said wing-like member jointly with said arm about said further axis for inspection of the display articles, without the articles being free for removal, the articles being removable only after release of the locking means and swinging of the wing-like member about the said first axis relative to said arm, whereby to move the said opening away from said blocking means.

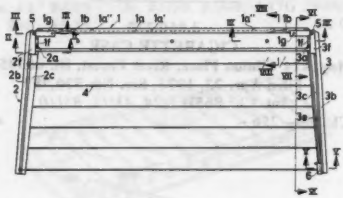
3,960,274

WALL-MOUNTED LAUNDRY DRIERS

Victor Trueb, Oberhelfenschwil, Switzerland, assignor to Heinz Hermann Weick, Geneva, Switzerland

Filed July 9, 1973, Ser. No. 377,834
Claims priority, application Switzerland, July 8, 1972, 10331/72
Int. Cl.² A47B 53/00
U.S. Cl. 211—1.3 10 Claims

1. A laundry drier for mounting on a vertical wall comprising: an elongated housing of U-shaped cross-section having an end wall at each end to leave an open face and means for attaching the housing to said vertical wall with said open face upwards, two support arms mounted by hinge means one at each end of said housing and movable between a closed position each to form a half cover for said open face of the housing, and an open position to extend outwardly from the respective end of the housing in a plane generally parallel with said open face of the housing, and a plurality of rows of flexible line extending between respective spaced points on said support arms to be taut and parallel when said arms are in said



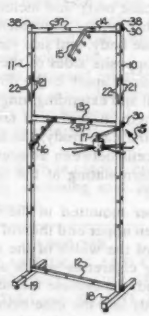
open position and to lie within said housing when said arms are in said closed position, said hinge means being arranged to provide pivotal movement between the respective arm and said housing about a first axis which is longitudinal of said housing and about a second axis which is transverse to said first axis.

3,960,275

MODULAR DISPLAY SYSTEM WITH INTERLOCKING FRAME MEMBERS

Paul F. Haughton, Troutman, and Thomas E. McCoy, Mooresville, both of N.C., assignors to Romac Metals, Inc., Troutman, N.C.

Filed Nov. 12, 1975, Ser. No. 631,107
Int. Cl.² A47F 5/14; A47B 3/00; F16B 9/00
U.S. Cl. 211—182 7 Claims



1. In a modular display system with interlocking frame members including at least a pair of tubular frame members with one of said frame members extending outwardly at a right angle from the other of said frame members, the combination therewith of connector means for rigidly interlocking said one frame member to said other frame member, said connector means comprising

a. said other frame member having a first multi-sided opening in one wall and a secnd multi-sided opening in the opposite wall thereof, said first and second openings being of the same size and shape and being aligned perpendicular to the longitudinal axis of said other frame member,

b. said one frame member including a multi-sided stud extending outwardly from the end of said one frame member and having a size and shape sufficient to provide a close fit of said stud in said first and second multi-sided openings in said other frame member, said predetermined size and shape of said stud being smaller than the size and shape of the adjacent end of said one frame member, and

the length of said multi-sided stud being at least equal to the distance between the outer surfaces of said opposite walls of said other frame member, and

c. means for removably locking said multi-sided stud of said one frame member in position in said first and second multi-sided openings in said other frame member to maintain the adjacent end of said one frame member against said one wall of said other frame member and in right angular and non-rotating relationship thereto.

3,960,276

TRANSPORTER FOR FLAT WORKPIECES

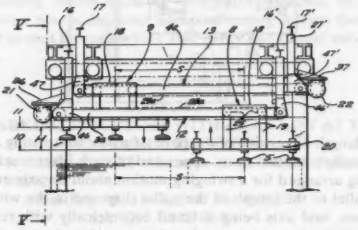
Klaus Gerhardt, Rheurdt, Germany, assignor to G. Siempelkamp and Co., Krefeld, Germany

Filed Mar. 10, 1976, Ser. No. 556,966

Claims priority, application Germany, Mar. 9, 1974, 2411299

Int. Cl.² B65G 59/04

U.S. Cl. 214—1 BT **10 Claims**



1. A machine for carrying flat workpieces along a predetermined path, comprising:

a rack extending from a loading station to an unloading station;

a first and a second track structure mounted on said rack for independent vertical displacement, each of said track structures including a plurality of substantially horizontal rails interleaved with those of the other track structure;

a first transport unit including a plurality of parallel carriages movable along respective rails of said first track structure;

a second transport unit including a plurality of parallel carriages movable along respective rails of said second track structure;

workpiece-engaging means on each of said transport units;

first and second lifting means for respectively displacing said first and second track structures together with their transport units between a lower working level and an upper return level; and

drive means correlated with said first and second lifting means for moving either of said transport units on said working level from said loading station to said unloading station while moving the other transport unit on said return level from said unloading station to said loading station.

3,960,277

MASK PLATE HANDLING APPARATUS

Alan G. Flint, 6821 Lenwood Way, San Jose, Calif. 95120

Filed Sept. 30, 1974, Ser. No. 510,284

Int. Cl.² B65G 51/02

U.S. Cl. 214—1 BH **13 Claims**

1. Apparatus for handling polygonal masks comprising

A. an infeed station including

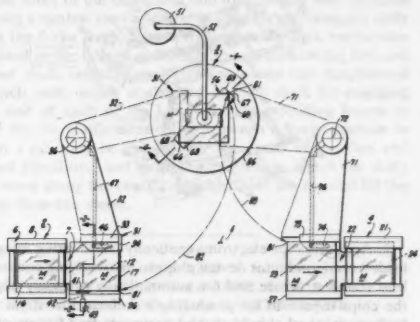
1. an indexable infeed magazine for a plurality of masks,

2. a fluid bearing track structure in conjunction with said infeed magazine for receiving masks in sequence therefrom and moving the same toward stop means for precisely positioning each such mask,

3. a vacuum transfer arm selectively positionable adjacent said track structure and carrying said stop means thereon,

4. such stop means including a stop shoulder contoured in accordance with the corner configuration of said masks mounted upon and movable with said transfer arm, and

5. means for urging each said mask laterally against said stop shoulder on said transfer arm to precisely locate



each such mask with its corner in engagement with said stop shoulder when said transfer arm is positioned adjacent said track structure,

B. a treating station to which said masks are transferred in sequence by said transfer arm from said stop shoulder following precise orientation thereof, and

C. means for effecting movement of said transfer arm with said precisely oriented masks carried thereby in sequence from said track structure to said treating station and for transferring such masks in sequence to said treating station without disturbing the orientation thereof.

3,960,278

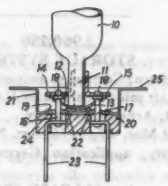
LAMP CAP ASSEMBLY

Arthur Samuel Vause, London, England, assignor to Burroughs Corporation, Detroit, Mich.

Filed Nov. 7, 1974, Ser. No. 521,572

Int. Cl.² H01J 5/50

U.S. Cl. 339—145 R **4 Claims**



1. An electric lamp comprising an envelope containing a light source and having a seal through which electrical leads pass and a lamp cap in which the seal is mounted, in which the cap has electrically-conductive terminal pins to which the electrical leads are connected and on which the envelope seal is mechanically supported, the terminal pins pass through the cap and are hermetically sealed thereto and the lamp cap has a peripheral flange lying in a predetermined position relative to an internal reference point of the envelope and in which the envelope is supported on the terminal pins by way of brackets embedded in the material of the seal and attached to the pins.

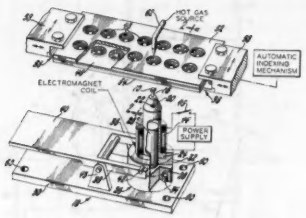
3,960,279
MAGNETIC ALIGNMENT FOR SEMICONDUCTOR DEVICE BONDING

Ronald J. Hartleroad, Twelve Mile; James C. Krajewski, and Ronald G. Rayon, both of Kokomo, all of Ind., assignors to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 414,274, Nov. 9, 1973, Pat. No. 3,887,997. This application Mar. 28, 1975, Ser. No. 563,092

Int. Cl.² B01J *17/00*

U.S. Cl. 214—1 BV **2 Claims**



1. Apparatus for electromagnetically transferring integrally leaded semiconductor device chips to an overlying conductive lead frame structure and for automatically precisely aligning the chips therewith for producing a uniform low stress bond between integral chip leads and corresponding fingers of said lead frame, said apparatus comprising:

a probe for supporting an integrally leaded semiconductor device chip, said probe being of a soft ferromagnetic material so as to concentrate magnetic lines of flux in the area of the integral chip leads located thereon, said probe having an end portion upon which the chip can be supported, said end portion having a flat surface portion which is slightly smaller than a major face of the chip, a soft ferromagnetic support member for holding said probe vertically, a coil of electrically conductive wire surrounding said probe support member and being longitudinally spaced from said probe but coaxial therewith, means connected to said coil for passing current through said coil for a desired time period so that the coil produces magnetic flux lines which flow longitudinally through said probe and perpendicular to said chip for magnetically raising the chip from the probe and transferring it to the lead frame finger set in precisely aligned engagement therewith and means for vertically moving said probe, said support means and said coil as a unit to position said chip in closely spaced relation beneath an overlying set of lead frame fingers.

3,960,280
STORAGE SYSTEM

Paul Stolzer, Achern, Germany, assignor to Keuro Maschinenbau Gesellschaft mit beschrankter Haftung & Co. Kommanditgesellschaft, Achern, Germany

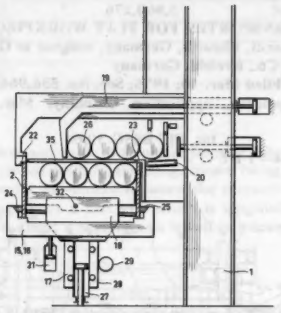
Filed Mar. 17, 1975, Ser. No. 559,022

Claims priority, application Germany, Mar. 15, 1974, 2412380

Int. Cl.² B65G *59/00*

U.S. Cl. 214—8.5 A **7 Claims**

1. In a storage system for storing and retrieving rod-shaped material, including a plurality of pallets for accommodating material, each pallet having a material-supporting bottom; storing means for storing the pallets; withdrawal means for retrieving a selected one of the pallets from the storing means; positioning means in the withdrawal means for adjusting the longitudinal and transverse position of the pallet and for lifting the pallet against stops in the withdrawal means; an apparatus for lifting the material out of, and lowering it into a pallet disposed in the withdrawal means; the apparatus having at least two lifters arranged serially with respect to the length of the pallet disposed in the withdrawal means; means for moving the lifters in unison vertically through apertures provided in the bottom of the pallet for engaging and moving the material with respect to the pallet; abutment means projecting from a side of the pallet inwardly thereof for cooperating with the lifters to arrest their upward motion when the lifted material has reached, above the pallet, a predetermined position from which it is displaceable transversely to the length of the pallet onto a conveyor leading to a cutting machine; the improvement wherein each pallet bottom is inclined transversely to



the length dimension of the pallet; further comprising a rocker pivotally attached to an upper end of each lifter; each rocker being arranged for a swinging motion about an axis extending parallel to the length of the pallet disposed in the withdrawal means; said axis being situated eccentrically with respect to the width of the pallet; in the direction of the higher-lying side of the pallet bottom; said abutment means including abutments situated on either side of said pallet disposed in said withdrawal means for cooperating with each rocker; said abutments having identical height positions.

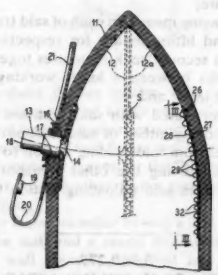
3,960,281
MEANS FOR PREVENTING DRY BURN IN A PAPER PLASTIC DUNNAGE BAG

Robert L. Reeves, Pinecrest Circle Drive, Sheridan, Ark. 72105

Filed Nov. 1, 1974, Ser. No. 520,014

Int. Cl.² B60P *7/14*

U.S. Cl. 214—10.5 D **6 Claims**



1. An inflatable dunnage bag comprising

multiple outer plies of paper and an inner ply of plastic formed as a closed inflatable baldder,

a one-way inflation valve having an inlet end disposed in an accessible location outside of said bag on a wall thereof and having an outlet end projecting inwardly of said plasitc inner ply through said wall to admit air under pressure inside of said bladder.

means to prevent dry burn when charging said bag with air comprising

a baffle positioned in register with said outlet end of said valve and being disposed between the confronting surfaces of said plastic inner ply when said bag is in deflated condition,

said baffle comprising a flat member of sufficient included area to baffle substantially all of the air projected through said valve into the interior of said bag,

said baffle having an effective expanded thickness at least in an area in register with said outlet end of said valve sufficient to separate said confronting surfaces of said plastic inner ply by a discrete distance when said bag is in deflated condition,

said baffle further having formed therein laterally and transversely disposed air passage means diffusing the air stream directed through said valve transversely of said valve and said plastic inner ply thereby to dissipate any vibratory forces tending to produce a dry burn effect on the surfaces of said plastic inner ply adjacent said outlet end of said valve,

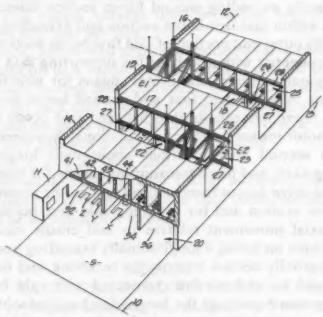
and fastening means securing said baffle adjacent to said plastic inner ply on the inner wall confronting surface thereof opposed to that through which said outlet end of said valve so projects.

3,960,282

CAR PARKING STRUCTURE WITH A CAR LIFT AT THE ENTRANCE THEREOF

Carlisle F. Manaugh, 522 Abramar Ave., Pacific Palisades, Calif. 90272

Filed July 15, 1974, Ser. No. 488,571
Int. Cl.² E04H 6/06
U.S. Cl. 214—16.1 CB **4 Claims**



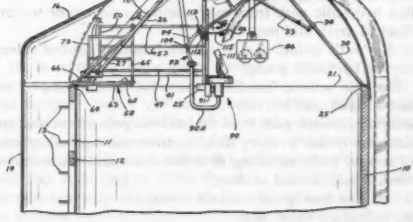
1. In a multiple story car parking system for storing cars, the combination of: at least one multiple story structural unit having rows of adjacent storage stalls on its stories opening to an adjacent craneway; an elevator mechanism mounted in said craneway for movement along the craneway across the face of the structural unit, and including an elevator platform mounted for vertical movement to each of the stores of the unit; a self-propelled dolly with retractable transverse forks supported on said elevator platform for carrying a car from the elevator platform and for depositing the car in one of the storage stalls on one of the stories of the unit; and at least one lift platform assembly mounted in a pit on the ground floor of the structural unit adjacent the craneway, said pit having two spaced and parallel longitudinal channels aligned with the elevator platform and further having a central interconnecting portion to provide the pit with an H-shaped configuration, said lift platform assembly comprising: a plurality of beams extending transversely across the central portion of the pit and across the parallel channels; a pair of beams mounted at each end of the first-named beam and extending longitudinally along the channel at each side of the pit; a first plurality of spaced transverse elongated cleats mounted on the forward end of each of the longitudinally-extending beams and extending partially across each of the aforesaid longitudinal channels for receiving the front wheels of a car to be deposited in a storage stall; a second plurality of spaced transverse elongated cleats mounted on the rear end of each of the longitudinally extending beams and extending partially across each of the corresponding longitudinal channels for receiving the rear wheels of the car; said cleats defining spaces therebetween for receiving the forks of the dolly, and said longitudinal side channels defining a central runway therebetween for receiving the dolly when the forks thereof are retracted; and a jack mechanism mounted in the central portion of the pit and having first and second shaft respectively extending along the longitudinal channels with means at the end of each shaft for engaging each end of each of the longitudinally extending beams to move the lift platform assembly between a lower position in which a car may be driven over the cleats of the first and second pluralities, and an upper position in which the dolly may move along the central runway under the car and lift the car up from the cleats.

3,960,283

SUPPORT FOR SILO UNLOADER, SILO SAFETY PLATFORM, AND SILAGE DISTRIBUTOR

Frederick E. Van Dusen, Hopkins, Minn., assignor to Van Dusen & Co., Inc., Wayzata, Minn.

Filed Jan. 2, 1975, Ser. No. 538,171
Int. Cl.² B65G 65/32; E04G 1/36
U.S. Cl. 214—17 CB **19 Claims**



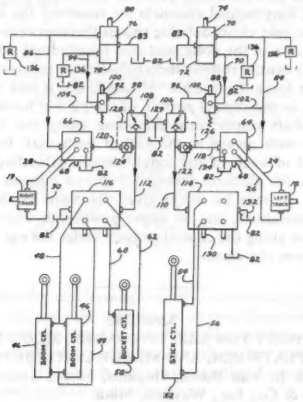
1. In combination for a silo having generally upright side walls, a support for a silo unloader mounted fixedly to the top of said silo walls including a plurality of support legs, means to fixedly join said legs to each other at a location generally overlying the center portions of said silo, said legs extending outwardly and downwardly from said means to fixedly join and being nonmovably supported to the upper edges of said silo walls, means to support a silo unloader mounted to said means to fixedly join, a nonmovable operator's platform mounted adjacent the upper edges of said silo comprising first support means fixedly supported to the upper edges of the side walls of the silo, and comprising members extending generally horizontally into the interior of said silo area below the level of said means to join said legs and offset from the center of the silo sufficiently to permit a silo unloader to be supported from said legs to operate in the silo, a platform attached to said first support means and being of size to accommodate and support a person thereon, and second support means for the interior end portions of said horizontal members comprising generally vertically extending support members fixedly attached to at least some of said legs.

3,960,284

HYDRAULIC BACKHOE CIRCUITRY

Emerl R. Carpenter, Edina, Minn., assignor to American Hoist & Derrick Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 293,819, Oct. 2, 1972, abandoned. This application Apr. 7, 1975, Ser. No. 565,381
Int. Cl.² E02F 3/32
U.S. Cl. 214—138 R 16 Claims



13. In combination with a backhoe excavator having right and left crawler tracks, a driveable boom, stick and bucket, a first function motor for driving a first of said tracks, separate function motors for driving each of said boom, stick and bucket, and means for driving a second of said tracks; a hydraulic circuit including:

a first hydraulic pump;

said first track function motor;

a first hydraulic path from said pump to said motor to carry fluid to drive said motor;

said first path including a first track function control valve;

a second hydraulic pump;

at least one second function motor for driving one of said boom, stick and bucket;

a second hydraulic path from said second pump to said second function motor to carry fluid to drive said second motor;

said second path including in order from said second pump toward said second motor:

a first function speed selector valve,

an unloading valve, and

a second function control valve;

said speed selector valve being selectively operable:

A. to form a part of said second path, and

B. to block flow in said second path to divert it to said first path to augment the output from said first pump to said first function traction control valve;

said first function control valve being selectively operable:

A. to form a part of said first path to permit fluid therein to pass to said first function motor to perform said first function, and

B. to block flow in said first path to said first function motor and to divert it to a first function control valve outlet line;

said first function control valve outlet line opening to a one way check valve;

said check valve opening to said second path between said unloading valve and said second function control valve;

there being a pressure control line open from said first function control valve outlet passageway to said unloading valve;

said unloading valve being operable responsive to the presence of at least a predetermined pressure in said pressure control line to divert flow from said second motor away from said second path; and

said second function control valve being selectively operable:

A. to form a part of the second path to permit the passage of fluid therealong to operate said second function motor, and

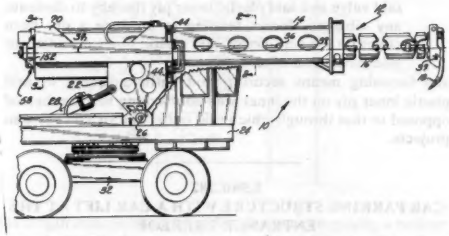
B. to block said second passageay to divert said hydraulic fluid from said second motor.

3,960,285

MATERIAL HANDLING APPARATUS

John W. Gano, New Philadelphia, Ohio, assignor to The Warner & Swasey Company, Cleveland, Ohio

Filed Oct. 4, 1974, Ser. No. 512,249
Int. Cl.² E02F 3/38
U.S. Cl. 214—141 21 Claims

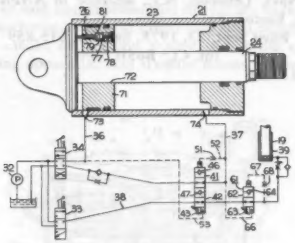


1. A material handling apparatus comprising a base, a longitudinally extending first boom section having axially inner and outer end portions, said inner end portion of said first boom section having an end wall which defines a first opening, a longitudinally extending second boom section telescopically disposed within said first boom section and extending through said axially outer end portion of said first boom section, cradle means connected with said base for supporting said first and second boom sections, first motor means for effecting axial movement between said first and second boom sections to vary the telescopic relationship between said boom sections, second motor means for effecting rotational movement of said first and second boom sections about their longitudinally extending axes, and force transmitting means for transmitting rotational drive forces from said second motor means to said first boom section and for retaining said first boom section against axial movement relative to said cradle means, said cradle means including a longitudinally extending body which at least partially defines a cavity for receiving said first boom section and an end portion connected with said body and extending transversely to the longitudinal axis of said body to at least partially define one end of said cavity, said inner end portion of said first boom section including an end wall disposed adjacent to said end portion of said cradle means, said force transmitting means including gear means disposed within said cavity between said end wall of said first boom section and said end portion of said cradle means, said gear means being connected to said first boom section and to said cradle means and including at least one gear disposed in a coaxial relationship with said first opening and having surface means defining a second opening in said one gear which is coaxial with said first opening, said first motor means including a first end portion extending through said first opening in said end wall of said first boom section and through said second opening in said one gear, said first motor means being spaced apart from said end wall of said first boom section and from said surface means defining said second opening in said one gear, said force transmitting means further including means for connecting said end portion of said first motor means to said end portion of said cradle means to transmit thrust forces from said first motor means to said end portion of said cradle means independently of said first boom section.

3,960,286
AUTOMATIC OVERLOAD CONTROL FOR A COUNTERBALANCED LIFT TRUCK

Ronald E. Spooner, Richton Park, and Terry R. Downing, Matteson, both of Ill., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Dec. 19, 1974, Ser. No. 534,454
Int. Cl.² B66F 9/20
U.S. Cl. 214—674 **9 Claims**



1. An overload protection system for a counterbalanced vehicle having a frame, a mast tiltable on the frame about a horizontal axis, a load support elevatable on the mast by a hydraulic lift jack and a double acting tilt jack having its opposite ends connected to the mast and the frame and operable to control the tilt of the mast, said system comprising:

a source of pressurized hydraulic fluid,

a tilt control valve connected to said source,

a lift control valve connected to said source,

a pair of tilt jack supply passages connected to said tilt control valve and extended to and connected with opposite ends, respectively, of said tilt jack,

a lift jack supply passage interconnecting said lift control valve and said lift jack,

automatic differential pressure operated valve means in one of said tilt jack supply passages and in said lift jack supply passage having pilot connections with opposite sides of said tilt jack and operative to prevent expanstion of said tilt and lift jacks when the pressure differential across said tilt jack exceeds a predetermined value,

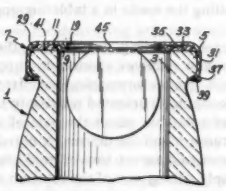
a piston in said tilt jack, and

an unloading valve in said piston automatically placing opposite axial sides thereof in fluid communication at the end of its retraction stroke.

3,960,287
EASY-OPEN ECOLOGY CROWN CAP

Charles T. Baker, Rutland, Vt., assignor to Vermont Marble Company, Proctor, Vt.

Filed May 5, 1975, Ser. No. 574,703
Int. Cl.² B65D 41/42
U.S. Cl. 215—253 **4 Claims**

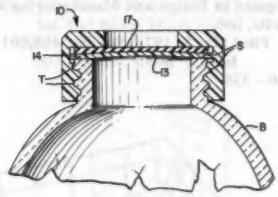


1. An integral bottle cap for a bottle having a circular outlet opening and an annular bead extending around the mouth of said opening, comprising: a depressed, substantially planer, circular central dome portion; an annular ring portion extending inwardly from the periphery of said dome portion with its lower surface in abutment with the opposed surface of said dome portion; an annular top wall portion extending outwardly from the inner edge of said annular ring portion with the upper surface of said ring portion in abutment with the lower opposed surface of said top wall portion, and an annular flange portion depending from the outer periphery of said top wall portion with its lower edge adapted to be crimped under the bead at the mouth of the bottle, said dome portion being scored only part way through the thickness of the material thereof from its top surface downwardly and in vertical alignment with the inner edge of said ring portion, the score forming a line extending around the dome portion and being interrupted to provide an unscored hinge portion, the depth of said score being sufficient to allow downward finger pressure on the center of said dome portion to break the cap material along the score line and permit the center of the dome portion to move downwardly about the hinge portion and into the upper end of the neck of the bottle.

3,960,288
BOTTLE CAP WITH MEANS TO EFFECT SEAL WITH IRREGULAR BOTTLE ENDS

Edwin D. Phillips, 170 Albert St., North Plainfield, N.J. 07060

Filed Mar. 5, 1975, Ser. No. 555,533
Int. Cl.² B65D 41/04
U.S. Cl. 215—329 **10 Claims**



10. In combination, a bottle having an externally threaded, open ended top portion presenting an annular, axially facing end surface; and a synthetic plastic bottle cap threadably engaged on the threaded top of the bottle, said cap comprising a body having a depending annular skirt with internal threads therein cooperably engaged with the threads on the bottle top; said cap including a relatively thin, yieldable end closure portion sealingly engaged with the end surface of the bottle; an annular back-up flange on the cap spaced axially from a peripheral, marginal portion of the closure portion; and a resilient insert between the marginal portion of the closure portion and the back-up flange; and the externally threaded portion and annular end surface of the bottle top being roughened to effect a secure, non-slip threaded engagement with the cap, and whereby when the cap is tightened on the bottle the end closure portion resiliently and yieldably engages the end surface of the bottle to effect a tight seal therewith even if the end surface has irregularities therein.

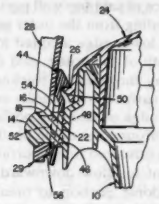
3,960,289
LATCHING RECEPTACLE LID

Richard L. Panicci, Hanover, Mass., assignor to Kiddie Products, Inc., Avon, Mass.

Filed Apr. 9, 1975, Ser. No. 566,179
Int. Cl.² B65D 25/28, 45/00
U.S. Cl. 220—318 **23 Claims**

1. A receptacle having an opening, a bail pivotally mounted thereon for rotation from one side of said receptacle, over said opening and to the other side of said receptacle, a lid for covering said opening and cooperating means on said receptacle, said bail and said lid for locking said lid on said receptacle

with said bail on one side and over said opening and for unlocking said lid with said bail on said other side, said means on said receptacle movable inwardly toward and outwardly away from said opening for respectively engaging and disengaging for locking and unlocking said means on said lid, and said



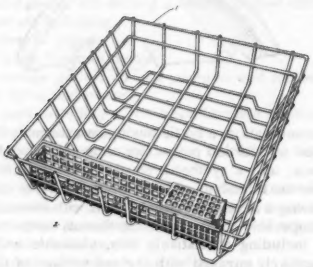
means on said bail engaging said means on said receptacle and adapted to move said means on said receptacle inwardly for engagement with said means on said lid with said bail on said one side and over said opening and adapted to move said means on said receptacle outwardly for disengaging said means on said lid with said bail on said other side.

3,960,290

UTILITY BASKET FOR A DISHWASHER

William H. Yake, and Donald G. Wallace, both of Connersville, Ind., assignors to Design and Manufacturing Corporation, Connersville, Ind.

Filed May 8, 1974, Ser. No. 468,001
Int. Cl.² B65D *51/04, 25/06*
U.S. Cl. 220—338 **5 Claims**



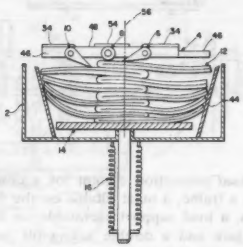
1. A utility basket for use in the upper or lower rack of a dishwashing machine, said utility basket comprising a structure having side walls, end walls and a bottom, said side walls being made up of a plurality of vertical and horizontal ribs joined together and defining a plurality of rectangular openings, said utility basket bottom comprising a plurality of longitudinal and transverse ribs joined together and defining a plurality of rectangular openings, a foraminous gate, said gate having a pair of spaced hinge lugs on one side edge thereof engaging a selected one of said vertical ribs of one of said utility basket side walls with a pivotal snap fit, said gate being swingable between first and second positions, said gate in said first position lying against said side wall to which it is hinged rendering the entire utility basket available for the receipt of tableware, said gate in said second position extending transversely of said utility basket to divide said utility basket into first and second portions, means to maintain said gate in said first position comprising a latch lug so located on said gate as to engage with a releasable snap fit another of said vertical ribs of said same utility basket side wall to which said gate is hinged, means to maintain said gate in said second position comprising a lug on the opposite side edge of said gate from said hinge lugs and a notch on the other of said utility basket side walls to receive said last mentioned lug, a lid, means for hingedly affixing said lid to said utility basket, said lid being swingable between an open position and a closed position wherein said lid covers said second portion of said utility basket, said lid being of foraminous construction.

3,960,291

FOLDED ARTICLE DISPENSING MACHINE

Menashe Navi, Lebanon, N.J., assignor to ANPA Research Institute, Easton, Pa.

Filed Sept. 23, 1975, Ser. No. 615,859
Int. Cl.² B65H *3/00*
U.S. Cl. 221—36 **9 Claims**



1. A sheet dispenser for dispensing a single newspaper, magazine or the like from the top of a stack, comprising in combination:

A. a frame means comprising a hopper means for holding a stack of folded paper articles in a partial overlapping vertical relation wherein the folded edges lie horizontally and overlap the folded edge immediately therebeneath, each folded edge being substantially parallel to a vertical plane of symmetry, and;

B. platform means operable to raise said stack of partially overlapped folded articles, and;

C. a horizontally movable stripper assembly positioned on said frame proximate the top of said stack, said stripper assembly further including wedge and roller means operable to successively strip the topmost folded article in both a horizontal movement from left to right and in a return horizontal movement from right to left.

3,960,292

APPARATUS FOR SINGULATING AND DEPOSITING SEEDS

Philip B. Knapp, Lynbrook, N.Y., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

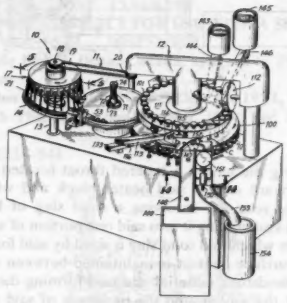
Division of Ser. No. 355,701, April 30, 1973, Pat. No. 3,849,041. This application Oct. 23, 1974, Ser. No. 517,204
Int. Cl.² B65G *29/00*
U.S. Cl. 221—211 **5 Claims**

1. Apparatus for singulating individual seeds from a bulk supply and depositing the seeds in a tableting apparatus, comprising

singulating means including a rotatable distributor tray having an annular receiver channel to support said bulk supply, a shaft, means supporting said tray for rotation about an axis angularly oriented relative to the axis of said shaft, a turret rotatable about the axis of said shaft and having a vacuum manifold therein, a plurality of fingers extending from said turret toward said channel to scan said bulk supply during part of the rotation of said fingers, said fingers having an internal bore portion connected with said manifold, seed receiving apertures formed in said fingers and communicating with said bore portions, said apertures being of lesser size than the seeds to be used therewith, drive means for rotating said turret for

sequentially moving said seed receiving apertures of said fingers through said tray and said bulk supply to support individual seeds over said apertures responsive to the subatmospheric pressure in said bores, a discharge station in the path of said fingers for receiving singulated seeds released at said station, vibrator means interposed between said bulk supply and said discharge station for engaging and oscillating said seed carrier fingers in the course of said movement, to detach excess seeds from said fingers, and means for increasing the pressure in said bores of said fingers when said fingers are in registry with said discharge station to effect said seed release, and

transfer means for feeding a seed to a mold cavity of a tableting apparatus, said transfer means comprising



a tubular conduit at said discharge station having an entrance end for admitting a seed and an exit end, means for inducing an air flow through said conduit adjacent said entrance end, thereby to impart a velocity to said seed in accordance with the velocity of said air flow, said conduit, at a portion intermediate said entrance and exit ends, including a curved conformation having air bleed portions of a size to preclude the passage therethrough of said seed, the area of said bleed portions being sufficient to permit substantially the entirety of said air stream to pass through said bleed portions, said seed being discharged at said exit end under inertia imparted by said air stream, and substantially the entirety of said air stream flows through said bleed portions whereby the air at said exit end is essentially quiescent.

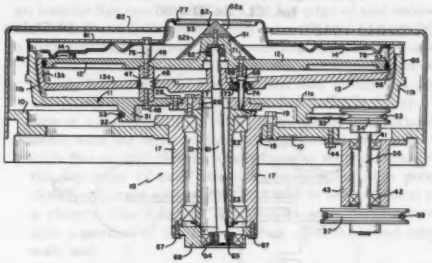
3,960,293

CENTRIFUGAL ARRANGING AND FEEDING APPARATUS

John R. Sweet, II, Sunnyvale, and Kingsley Chan, Saratoga, both of Calif., assignors to Acurex Corporation, Mountain View, Calif.

Filed Feb. 13, 1975, Ser. No. 549,691
Int. Cl.² B65G *59/00*
U.S. Cl. 221—258 **15 Claims**

1. In apparatus for delivering articles single file in a predetermined direction: a disk mounted for rotation about a vertical axis and adapted to receive articles to be delivered toward the center thereof, said articles being urged outwardly toward the periphery of the disk by centrifugal force as the disk rotates, means forming a retaining ring adjacent to the surface of the disk for limiting outward movement of the articles a predetermined distance from the center of the disk, a delivery ring adjacent to the periphery of the disk and constrained for rotation with the disk, means for lifting the retaining ring away from the disk in a first region of disk travel to permit the articles to move to the periphery of the disk in that region and effecting a transfer of the articles from the periphery of the disk to the delivery ring in a second region of travel, and guide means for retaining the articles on the delivery ring between the second region and a discharge region where the articles



are released for delivery along a line extending generally tangentially of the delivery ring in the predetermined direction.

3,960,294

VISCOUS MATERIAL DISPENSER

Rodolphe J. Bernard, 16330 Sandalwood, Fountain Valley, Calif. 92708

Filed June 18, 1975, Ser. No. 587,909
Int. Cl.² B65D *35/28, 5/64*
U.S. Cl. 222—103 **8 Claims**

1. A dispensing device for viscous materials comprising:

a housing having a pair of hinged walls;

a container means wherein the viscous material is stored therein, said container being removably disposed in said housing;

hinge means positioned along the lower portion of said walls for pressure engagement with said container means;

a discharge tube operably connected at one end thereof to said container means, whereby said viscous material can flow therefrom;

a compression means attached to each of said walls, imparting an inward compression force thereto;

wherein said compression means includes a take-up mechanism, said compression means being hingedly attached to one wall of said housing, and said take-up mechanism being operably accuated by the compression means and removably attached to said opposite wall whereby the viscous material is continuously and automatically placed under discharge pressure;

a control-valve means mounted to said discharge tube, whereby the flow of material is controlled from said container; and

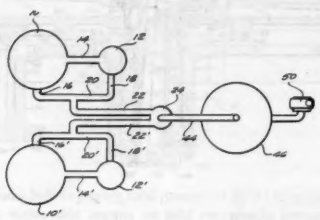
coupling means formed in the free end of said discharge tube.

3,960,295

CONTINUOUS LIQUID PROPORTIONING SYSTEM

Vladimir Horak, 353 High St., Closter, N.J. 07624

Filed Aug. 19, 1974, Ser. No. 498,793
Int. Cl.² B67D 5/60
U.S. Cl. 222—145 **10 Claims**



1. A liquid proportioning system comprising:
first and second groups of positive metering tanks, both connected to a mixer and arranged for alternate feeding to said mixer, each of said groups including a plurality of positive metering tanks, each containing a supply of liquid component to be mixed, and each being connected to a supply source of liquid component for filling said tank,
means connecting the tanks in each of said groups for maintaining a uniform pressure in said tanks above the liquid component therein,
each positive metering tank including adjustable outlet means for feeding a selected volume of the contained liquid component from the tank per unit of time and in constant selected proportion to the liquid components fed from the other metering tanks in its group,
a single conduit connecting the outlet means of each metering tank in one group to said mixing tank, whereby the liquid components fed from said metering tanks flow continuously in exact measured proportions through said conduit to said mixer,
a reservoir tank connected to the outlet of said mixer,
means connecting the outlet of said reservoir tank to a point of use,
and control means for closing the outlet means of the metering tanks of one group when said one group of tanks becomes depleted, opening the outlet means of the other group of metering tanks, and causing said one group of tanks to be refilled from said supply source while said other group of tanks is feeding liquid to said mixer.

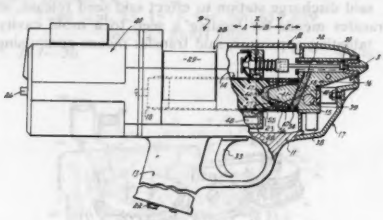
3,960,296

THERMOPLASTIC DISPENSER

Eric T. Nord, Oberlin, Ohio, assignor to Nordson Corporation, Amherst, Ohio

Filed Sept. 9, 1974, Ser. No. 504,378
Int. Cl.² B67D 5/62
U.S. Cl. 222—146 HE **14 Claims**

1. A dispensing device for translating solid slugs of thermoplastic feedstock material from a solid state to a molten state and for dispensing said feedstock while in the molten state, said dispensing device comprising
a barrel having an input end and a discharge end,
a ram movable within said barrel to effect movement of a solid slug of thermoplastic feedstock material from the input end of said barrel toward the discharge end,
a heater located adjacent the discharge end of said barrel for heating said feedstock and converting it from the solid to the molten state, said heater including a heater block located within said barrel and projecting rearwardly from the discharge end of the barrel and having a peripheral surface radially spaced inwadly from the inside surface of said barrel
said barrel having successive zones defined therein comprising a solid feedstock feed zone, a feedstock softening zone, and a feedstock melt zone, said feedstock melt zone being located adjacent the discharge end of said barrel and in close proximity to said heater block, and
a tubular forming die at least partially located within said feedstock softening zone of said barrel, said forming die having at least one portion of a lesser inside diameter than the solid feedstock feed section of said barrel,



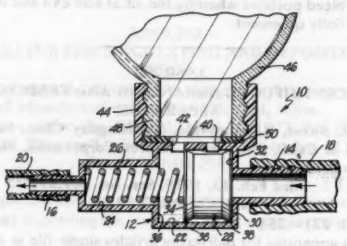
said forming die having a tapered throat located adjacent the rearward end of said heater block and within said softening zone for receiving a solid slug of feedstock material and guiding it into said one portion of said forming die in which said solid slug is sized by said forming die so that surface contact is maintained between said solid slug of feedstock material and said forming die substantially all the way around the periphery of said solid slug of feedstock material, said surface contact being operative as a physical dam to prevent rearward flow of molten feedstock material past said one portion of said forming die.

3,960,297

LIQUID MEASURING DEVICES

James B. Stephens, La Crescenta, and Frank R. Anderson, Hacienda Heights, both of Calif., assignors to Westates Space-Era Products, Inc., So. El Monte, Calif.

Filed June 24, 1974, Ser. No. 482,227
Int. Cl.² G01F 11/38
U.S. Cl. 222—449 **9 Claims**



1. A liquid measuring device which comprises:
a housing having an inlet and an outlet, said inlet and said outlet being in communication with the interior of said housing,
accumulator means including a completely enclosed vessel for storing liquid at approximately the pressure of liquid supplied to said inlet, the interior of said vessel being closed off from the exterior of said vessel, said accumulator means being connected to the interior of said housing,
inlet valve means for controlling the flow of liquid into said housing associated with said inlet,

outlet valve means for controlling the flow of liquid from said housing associated with said outlet,

both of said valve means are capable of being opened and closed in response to the pressure of liquid supplied to said inlet, said inlet valve means being opened and said outlet valve means being closed when liquid is supplied to said inlet at an elevated pressure, said outlet valve means being open and said inlet valve means being closed when the liquid at said inlet is at a lower pressure,

said accumulator means being capable of receiving liquid flowing into said housing through said inlet valve means when said inlet valve means is open and being capable of discharging liquid located therein through said outlet valve means when said outlet valve means is open.

3,960,298

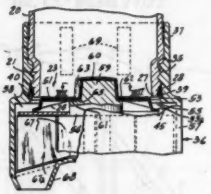
CONTAINER ASSEMBLY FOR USE WITH A SEPARATOR DISPENSER

Peter Leslie Birrell, Delta, Canada, assignor to The Cornelius Company

Division of Ser. No. 300,505, Oct. 25, 1972, Pat. No. 3,828,973. This application Apr. 19, 1974, Ser. No. 462,420

Int. Cl.² B65D *47/10*

U.S. Cl. 222—541 **11 Claims**



1. A container assembly for use with a separate dispenser, comprising: a container initially filled with flowable particulate material; mounting means on the container at its discharge end adapted for detachably making said container coactive with structure on the dispenser; and a unitary diaphragm closure initially closing the discharge end of the container and having a rupturable circular line of weakness defining a prospective relatively axially displaceable body portion having the physical properties enabling it to be used in the dispenser to modulate an annular flow of the material through said discharge end.

3,960,299

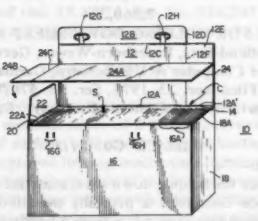
INDUSTRIAL STRAW DISPENSING CARTON

Paul Hollinger, Randallstown, Md., assignor to Maryland Cup Corporation, Owings Mills, Md.

Filed June 12, 1975, Ser. No. 586,246

Int. Cl.² B65D *47/00*

U.S. Cl. 222—559 **2 Claims**



1. Container means for dispensing a plurality of elongated objects in a common orientation and at a preselected rate of egress comprising:

a substantially rectangular cavity defined by first and second opposed side walls, first and second opposed end walls, a bottom wall and a foldable closure lid coextensive with the top edge of said first sidewall;

an interior flap coextensive with the top edge of said second end wall and foldable inwardly beneath said closure lid;

a slide member substantially coextensive with the top edges of said side walls and said end walls overlying said inwardly folded interior flap beneath said closure lid and extending outwardly of said second end wall in the provision of a retaining tab foldable downwardly into juxtaposition with the outer surface of said second end wall;

a score line on said closure lid coextensive with a portion of the top edge of said sidewall commencing at a point closely adjacent said second end wall in the provision of a closure flap foldable downwardly into juxtaposition with a portion of the outer surface of said second sidewall; and

a removable section on said closure lid extending from the termination of said closure flap to said first end wall to define a maximum dispensing opening with the top edges of said first end wall and said first and second sidewalls;

said slide member being slidably retained beneath said closure lid and adjustably positionable to selectively vary the size of said dispensing opening between a fully closed condition and said maximum.

3,960,300

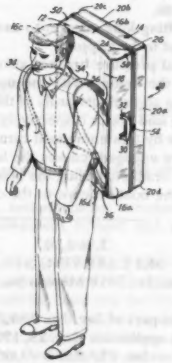
TAMPER-PROOF BACKPACK

Paul J. Dickler, 37 W. 8th St., New York, N.Y. 10011

Filed Jan. 25, 1974, Ser. No. 436,491

Int. Cl.² A45F *3/00*

U.S. Cl. 224—8 R **2 Claims**



1. A tamper-proof backpack adapted to be carried on the back of a user and comprising a backpack body having side walls and a concave-shaped rear wall defining a space for storing material, a backpack cover hingedly connected to one of said side walls and adapted to swing from an open position providing access to said storage space to a closed position sealing said storage space, said backpack body and backpack cover formed of a plastic resilient material, locking means for securing said backpack cover to said backpack body in its closed position, means cooperating with said concave-shaped rear wall for enabling said backpack to be carried on the back of a user, with the concave-shaped rear wall facing the user's back, and means for securing said backpack to a stationary object, said securing means including a cable having a first end connected within the storage space of the backpack and a second end adapted to be withdrawn from said storage space, wrapped around said stationary object and thereafter inserted back into said storage space and means for preventing said

second end of the cable from being withdrawn from said storage space after the cable has been wrapped around said stationary object.

3,960,301

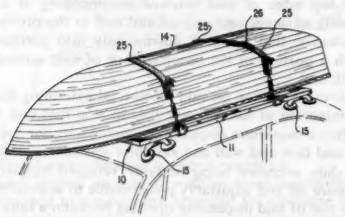
BOAT TRANSPORT ANCHORING MEANS

Thomas J. Miller, 800 Lombard Ave., Evansville, Ind. 47715

Division of Ser. No. 365,709, May 31, 1973. This application Nov. 18, 1974, Ser. No. 524,886

Int. Cl.² B60R *9/08*

U.S. Cl. 224—42.1 R **3 Claims**



1. For use with a boat supporting car top rack, a boat transport anchoring device comprising

a. at least a pair of anchoring means secured along the car top rack at opposed positions,

b. a threaded shank secured to each of said anchoring means,

c. a pair of hooks each having a threaded shank,

d. a pair of turnbuckle means, each turnbuckle receiving the threaded shanks of one of the hooks and one of the anchoring means,

e. a strip of belting long enough to extend around the bottom of a boat to be gripped,

f. a right angled pressure bracket affixed adjacent each of the ends of the belting with the upper portion of each bracket being angled outwardly of the boat and apertured for receiving said hooks respectively, whereby tensioning of the device by tightening said turnbuckle means, when the hooks are engaged, causes the belting to tighten and the pressure brackets to hug the boat thereby preventing slippage of the boat relative to the carrier.

3,960,302

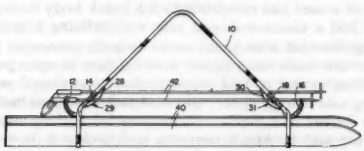
SKI CARRYING STRAP

Albert H. Mazzoni, Jr., 3910 Mission St., San Francisco, Calif. 94112

Continuation-in-part of Ser. No. 384,560, Aug. 1, 1973, abandoned. This application Nov. 25, 1974, Ser. No. 527,102

Int. Cl.² B65D *71/00*

U.S. Cl. 224—45 S **4 Claims**



1. Apparatus for hand-carrying a pair of skis and ski poles comprising a strap adapted to be placed over the shoulder of the carrier, a first end of said strap adapted to be loosely tied to the forward portion of the skis to form a first tied portion, the second end of said strap adapted to be loosely tied to the rearward portion of the skis to form a second tied portion; spaced strips of mutually engageable fastening material attached to the strap adjacent the first end thereof on opposite sides of the first tied portion and engageable to inhibit untying of the first end of the strap, at least one of said spaced strips of fastening material adjacent the first end of the strap having a loose flap section unattached to the strap; and spaced strips of mutually engageable fastening material attached to the strap adjacent the second end thereof on opposite sides of the second tied portion and engageable to inhibit untying of the second end of said strap, at least one of said spaced strips of fastening material attached to the strap adjacent the second end having a loose flap section unattached to the strap, whereby disengagement of the corresponding strips of fastening material due to tension in the strap is inhibited.

3,960,303

METHOD AND APPARATUS FOR STABILIZING A LONGITUDINALLY MOVING WEB OF MATERIAL

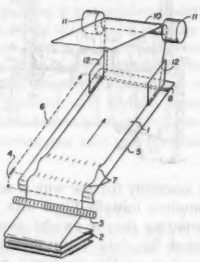
Raimondo Gatti, Gallarate, Italy, and Franz Josef Gierse, Wickrathberg, Germany, assignors to Franz Muller Maschinenfabrik, Monchen-Gladbach, Germany

Filed Oct. 4, 1973, Ser. No. 403,430

Claims priority, application Germany, Nov. 18, 1972, 2256638

Int. Cl.² B65H *23/04*

U.S. Cl. 226—1 **3 Claims**



1. A method for stabilizing a web of textile material moving unstably in longitudinal direction thereof comprising:

guiding the web onto a smooth, rigid and flat surface defined by means formed of electrostatically chargeable material; and

moving the web along the surface at a velocity exceeding 200 meters per minute at which an underpressure is created between the web of textile material and the smooth, rigid and flat surface, and the web is electrostatically attracted to said surface, whereby the moving web of material is stabilized on the smooth, rigid and flat surface.

3,960,304

DEVICE FOR HOLDING DOWN SHEET MATERIAL

Güenter Holland-Letz, Paderborn-Wewer, Germany, assignor to Nixdorf Computer AG, Paderborn, Germany

Filed Apr. 23, 1975, Ser. No. 570,771

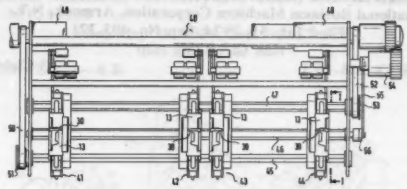
Claims priority, application Germany, Apr. 23, 1974, 2419571

Int. Cl.² G03B *1/30*

U.S. Cl. 226—74 **7 Claims**

1. A device for holding down sheet material on a conveyor, which device comprises a pivotally mounted flap member which is spring-biased to move from a holding down position towards an open position, and a locking device for locking the flap in the holding down position, the locking device comprising a locking arm mounted on a shaft, the arm being pivotable between a locking position in which it engages over a part of

the flap to lock it in the holding down position, and an unlocked position in which the flap is free to move to its open



position, the pivotal axis of the flap being perpendicular to the axis of the shaft.

3,960,305

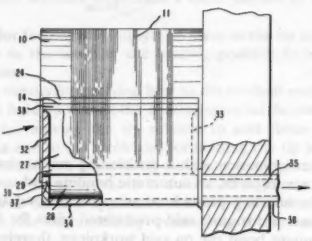
SLOT VACUUM JET

Edward Michael Joseph Boyle, Park Forest, Ill., and Melvin Harry Johnson, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed July 11, 1974, Ser. No. 487,817

Int. Cl.² B65H *17/32*

U.S. Cl. 226—95 **2 Claims**



1. In an aspirating apparatus that includes a suction nozzle coupled to an elongated manifold having a source of suction connected at one end, the improvement comprising: said nozzle having a slot shaped intake passage in continuous lengthwise communication with said manifold; and said manifold having an orifice continuously open to atmosphere located at its other end to assist in the development of parallel fluid flow along the length of the manifold.

3,960,306

DRIVING MECHANISM FOR ENDLESS SENSITIVE MEMBER

Hiroshi Hamaguchi, Sakai, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

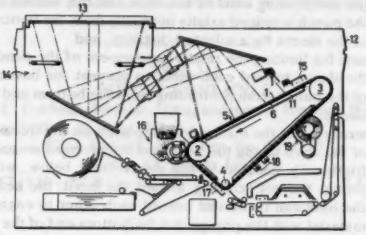
Filed Oct. 18, 1974, Ser. No. 516,245

Claims priority, application Japan, Oct. 31, 1973, 48-123023

Int. Cl.² B65H *17/28*

U.S. Cl. 226—96 **7 Claims**

1. In an electrophotographic duplicator having an endless photosensitive member made of a wide sheet material with a photosensitized surface, said sheet material having a discrete elasticity, an improved driving mechanism for the photosensitive member comprising a pair of endless belts mounted on a plurality of parallel-axis rollers with adjacent borders thereof spaced less than the width of said sheet material, said belts being of a material having an elasticity substantially equal to said discrete elasticity and at least one of the belts having non-slip means engaging a driven one of the rollers for movement therewith, the longitudinal edges of the photosensitive member being mounted along said adjacent borders of the belts in superposed relation therewith and means fixing said



photosensitive material to each said belt and being thereby driven conjointly with said belts.

3,960,307

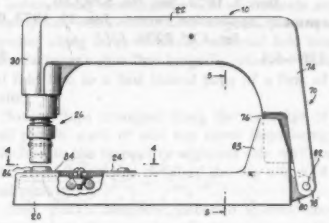
APPARATUS FOR ATTACHING ORNAMENTS TO SHEET MATERIAL

John S. Doyel, 404 W. 20th St., New York, N.Y. 10011

Continuation-in-part of Ser. No. 479,522, June 14, 1974, abandoned. This application June 16, 1975, Ser. No. 587,282

Int. Cl.² B25C *1/00*

U.S. Cl. 227—144 **4 Claims**



1. Apparatus for attaching a pronged ornament to sheet material comprising:

a base and a head, and means for connecting the base and the head for movement toward and away from each other;

an anvil and means for connecting the anvil to the base for rotation in a plane transverse to the direction of relative movement between the base and the head and for movement along said plane with respect to the base, said anvil having a free surface facing the head;

a plunger and means for releasably connecting the plunger to the head, with the plunger extending from the head toward the anvil, said plunger comprising:

a sleeve having a pair of axially extending slots which are diametrically opposite each other and are open at the axially bottom end of the sleeve but terminate prior to the axially upper end of the sleeve;

a hollow, tubular punch having a axially lower portion closed at the axially bottom end of the punch and fitting slidably within said sleeve for axial movement with respect thereto, said lower portion of the punch having a pair of axially extending slots which are diametrically opposite each other and are open at the axially top end of said lower portion of the punch but terminate prior to the axially bottom end of the punch;

an elongated retainer pin extending through all four of the slots and having heads at the longitudinally spaced ends thereof which are slightly larger than the slots, to thereby retain the pin in place when the heads thereof are radially outwardly of the slots;

biasing means engaging said sleeve and punch and urging said sleeve and punch axially away from each other, toward a relative axial position in which the pin engages the terminating ends of the slots and the bottom end of the punch is spaced axially upwardly from the bottom end of the sleeve by a selected distance, and

means for limiting the relative movement of the punch and the sleeve toward each other to prevent the bottom end of the punch from protruding from the bottom end of the sleeve;

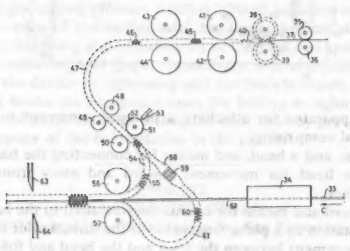
whereby when the material is supported on the free surface of the anvil facing the head and the pronged ornament is frictionally inserted in the sleeve from below, with the prongs thereof pointing toward the anvil, the head and the base can be moved toward each other to engage the material with the prongs and the bottom end of the sleeve and to thence move the punch axially downwardly with respect to the sleeve to force the prongs through the sheet material and against the anvil and thereby deform the prongs and secure the ornament to the sheet material.

3,960,308

APPARATUS FOR AFFIXING SURFACE ENLARGING MEMBERS IN THE FORM OF COHERENT TRANSVERSALLY CORRUGATED METAL STRIPS TO ELONGATE METAL BASIC PROFILES

Karl Gunnar Jonason, Grindstuvagen 13, 724 62 Vasteras, Sweden

Division of Ser. No. 435,993, Jan. 23, 1974. This application Dec. 3, 1974, Ser. No. 529,130
Claims priority, application Sweden, Jan. 29, 1973, 012114
Int. Cl.[2] B23K *1/12*
U.S. Cl. 228—5.1 5 Claims



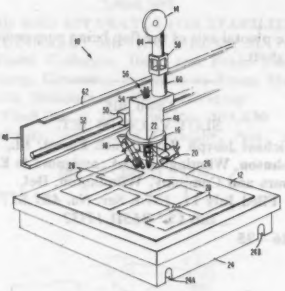
1. Apparatus comprising means for continuously advancing a metal basic profile in a movement path at a substantially constant speed, heating means arranged in said movement path for heating said basic metal profile to an elevated temperature, means for continuously feeding corrugated strip material in a movement path arranged to guide said strip material into side-by-side contact with the basic profile at a location downstream of the heating means, and means arranged in the movement path of the strip material upstream of its point of contact with the basic profile for applying solder to the crests of the corrugations of said corrugated strip material, at least on one side of said material, said solder being solidified at said crests as the corrugated strip material approaches the location of contact with the basic profile, said basic profile at said location of contact having a temperature sufficiently high to melt said solder and effect joinder of the corrugated strip material at said crests to said basic profile.

3,960,309

FINE WIRE TWISTED PAIR ROUTING AND CONNECTING SYSTEM

Herbert Kenneth Hazel, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed July 31, 1974, Ser. No. 493,371
Int. Cl.[2] B23K *1/20*
U.S. Cl. 228—5.1 3 Claims



1. In combination with a positioning mechanism for positioning a workpiece, an automatic bonding and routing apparatus for bonding pre-twisted wires to a bond site on said workpiece and routing said pre-twisted wires for bonding on a subsequent bond site on said workpiece, thereby forming a net, said apparatus comprising:

a turret-head;

wire supply means mounted to said turret-head for supplying said pre-twisted wires;

wire feeding means operable connected to said turret-head for feeding said pre-twisted wires from said wire supply means and forming a loop for bonding in said pre-twisted wires;

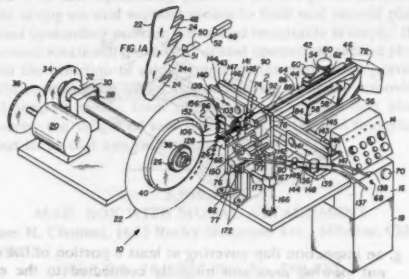
bonding means operably connected to said turret-head and lying in a plane orthogonal thereto, having a center line parallel to a reference line passing through the center line of said formed loop for engaging said formed loop and bonding said pre-twisted wires to said bond site on said workpiece; and

clamping means operably connected to said turret-head for receiving said pre-twisted wires from said wire feeding means and breaking said pre-twisted wires at a point beyond said bond site after bonding thereof, said clamping means comprising a housing support having guide rods affixed to said turret-head and sleeves slidably connected to said guide rods for positioning said clamping means towards or away from said bond site, a pair of receiving jaws operably connected to said housing means for receiving anad clamping said pre-twisted wires, first means operably connected to said receiving jaws for opening said receiving jaws so as to partially release, but yet, retain said pre-twisted wires, second means operably connected to said receiving jaws for opening thereof so as to completely release said pre-twisted wires, and third means attached to said slidable sleeves for controlling the position thereof on said guide rods so as to position said receiving jaws towards or away from said workpiece.

3,960,310
APPARATUS FOR BRAZING HARDENED TIPS TO SURFACES

Lucian Nussbaum, 423 Berrywood Court, West Hempstead, N.Y. 11552

Filed May 20, 1974, Ser. No. 471,450
Int. Cl.² B23K 1/04
U.S. Cl. 228—6 R 11 Claims

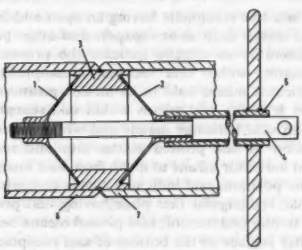


1. In an apparatus for brazing a hardened tip to a tooth of a toothed member having meltable brazing material therebetween, the invention comprising means movably mounting said toothed member to present a tooth thereof to a brazing position,
means for feeding and applying a force to the tip to hold the same to the tooth in the brazing position to be brazed thereto,
heating means for applying heat to the toothed member and to the held tip to melt the brazing material therebetween,
means for moving the tip relative to said force applying means and to the tooth and for holding the tip in brazing position on the tooth until the braze is completed,
said means being operable in a selected sequence,
and means on said apparatus connected with each of said means for automatically controlling their sequence of operation.

3,960,311
BACKING RING ASSEMBLY FOR PIPES

Raymond Paul Griffiths, Melton Nowbray, England, assignor to Welding Controls Limited, Northampton, England

Filed Nov. 25, 1974, Ser. No. 526,839
Claims priority, application United Kingdom, Nov. 27, 1973, 55038/73
Int. Cl.² B23K 5/22
U.S. Cl. 228—49 17 Claims

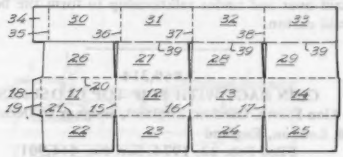


1. A backing and alignment ring assembly comprising a segmented backing ring having a cylindrical external surface for engagement in a pipe bore the segments of said ring being provided with inter-engaging and overlapping lips and recesses on said surface, a pair of spaced hub members located substantially on the axis of the ring, axially extending actuating means connected to the hub members for providing relative axial movement of the hub members, and radially and axially extending connecting means attaching each hub member to the ring whereby said relative axial movement of the hub members produces radial expansion or contraction of the ring.

3,960,312
DIE CUT CONTAINER

Jack C. Gorham, Keokuk, Iowa, assignor to Hoerner Waldorf Corporation, St. Paul, Minn.

Filed Aug. 25, 1975, Ser. No. 607,715
Int. Cl.² B65D 5/02
U.S. Cl. 229—37 R 2 Claims

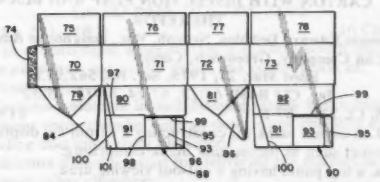


1. A die-cut blank made from foldable sheet material, said blank adapted to be folded into a rigid sided container having top closure flaps and a liner around the inside of the walls of the container, said liner formed as a removable portion of said blank, said blank comprising:
four substantially rectangular side wall panels arranged in side-by-side relationship and hingedly connected to one another along three vertically oriented fold lines;
a manufacturer's glue flap hingedly attached along a vertical fold line to a first lateral edge of a first of said side walls;
top closure flaps arranged along the top edge of said side wall panels, each of said top cover flaps being hingedly attached to the respective adjacent side wall panel along a horizontal fold line defining the top edges of said side wall panels;
four liner panels hingedly attached to one another and located along the top edge of said top closure flaps, a first of said liner panels positioned said first side wall being unconnected to the top closure flap adjacent said first side wall, each of the remaining three of said liner panels being removably attached to the respective adjacent top closure flap.

3,960,313
AUTOMATIC SETUP CARTON CONSTRUCTIONS

Alan M. Sax, Chicago, and Walter J. Stolkin, Schaumburg, both of Ill., assignors to Stolmar Corporation, Chicago, Ill.

Filed Nov. 15, 1974, Ser. No. 523,996
Int. Cl.² B65D 5/10, 5/48
U.S. Cl. 229—41 B 10 Claims



1. An automatic setup carton formed from a precut corregated paper blank comprising
a. four side panels including two outer panels and two inner panels disposed on said blank defined by score lines between adjacent panels,

b. four bottom panels each extending downwardly from one of said side panels and defined by a score line therebetween, and

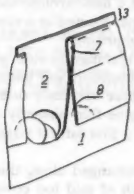
c. glue flaps defined by score lines on the two bottom panels extending downwardly from said inner panels to adhesively secure the remaining bottom panels thereto, one of said inner bottom panels and one of said outer bottom panels being secured in over and under relationship wherein one end thereof is over one of the adjacent panels while the other end thereof is under the other adjacent bottom panel, said carton being maintained in a flat condition prior to setup with the bottom panels folded onto the side panels and upon setup the side panels are spread apart to form a rectangular configuration causing the interconnected bottom panels to automatically deploy in said over and under relationship to form the bottom of said carton.

3,960,314

COIN BAGS WITH FLIP TOP CLOSURES

John Alan Faiers, London, England, assignor to Decoflex Limited, London, England

Filed Feb. 22, 1974, Ser. No. 444,901
Int. Cl.² B65D *33/16*
U.S. Cl. 229—62 **4 Claims**



1. A bag formed of a pliable material, comprising:

front and back panels joined along a fold defining the bottom of the bag and sealed together along respective adjoining side margins with an open mouth opposite said bottom;

said front panel being folded upon itself along a fold horizontal to said mouth and sealed along the side portions to form an external pouch, said flap being joined with said front panel by a seal extending transversely across said front panel between said mouth defining fold and the end of said pouch to form an enclosed portion; and

said bag being adapted to be closed by folding said pouch about said transverse seal to form a hood over said mouth whereby said enclosed portion engages and deforms said back panel to form a barrier inside said hood.

3,960,315

CARTON WITH INSPECTION FLAP AND BLANK THEREFOR

Thomas Edward Dobbins, Neenah, Wis., assignor to American Can Company, Greenwich, Conn.

Filed Mar. 27, 1975, Ser. No. 562,913
Int. Cl.² B65D *65/12, 65/14, 65/18, 65/32*
U.S. Cl. 229—87 F **11 Claims**

1. A carton blank for constructing a carton for displaying a product such as bacon, said blank comprising:

a. a top panel having a cut-out viewing area,

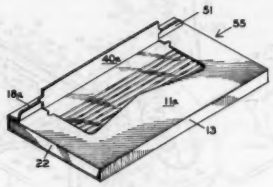
b. a bottom panel,

c. a glue flap,

d. an edge section of the top panel being located between the cut-out viewing area and one edge of the top panel adjacent the cut-out viewing area and having substantially the same width as the glue flap,

e. a first side wall hingedly connected along fold lines at opposite edges to the top and bottom panels, said first side wall being connected to said top panel at the edge opposite said edge section of said top panel,

f. a second side wall hingedly connected along fold lines at opposite edges to the bottom panel at the edge of the bottom panel opposite the edge thereof to which said first side wall is connected and to the glue flap,



g. an inspection flap covering at least a portion of the cut-out viewing area and hingedly connected to the edge section of the top panel along a hinge line and having sides connected to the top panel by lines of weakness, and

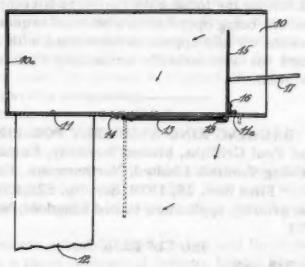
h. end flaps hingedly connected along fold lines to the side edges of the top and bottom panels.

3,960,316

NEWSPAPER ARRIVAL INDICATORS

Hubert H. Echterling, 12802 W. 129th Ave., Cedar Lake, Ind. 46303

Filed Apr. 12, 1974, Ser. No. 460,491
Int. Cl.² B65D *91/00*
U.S. Cl. 232—1 C **1 Claim**



1. In a box-like receptacle having an open end for insertion of printed matter such as newspapers and other printed matter, an assembly to visually indicate the presence of such printed matter within said receptacle comprising movable visual indicator means held in an unseen position when said receptacle is empty and means within said receptacle which coacts with said indicator means and which is responsive to the insertion of said printed matter into said receptacle to cause said indicator means to move from said unseen position to a visible position; said indicator means comprising a gravity-movable, rectangular first plate having first pivotal means attached to one end thereof, said pivotal means being secured to the outer surface of the bottom of said receptacle with the axis of the pivotal means being perpendicular to the length of said receptacle and positioned on said outer surface a distance from said open end which is greater than the length of said first plate when said first plate is in said unseen position; said insertion responsive means comprising a rectangular second plate having second pivotal means to pivotally mount said second plate on the inner surface of said bottom in an upstanding position within, and cross-wise of, said receptacle

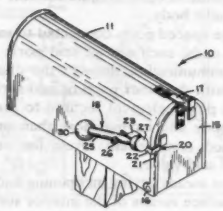
adjacent the open end of said receptacle when same is empty, said pivotal means providing for rotational movement of said second plate only toward the interior of said receptacle to the inner surface of said bottom, at least one portion of said second plate extending through at least one opening in said bottom, the said at least one portion having its terminal edge formed as a rearwardly extending support means for the other end of said first plate in said unseen position when said second plate is in said upstanding position, the weight of said first plate acting on said support means to hold said second plate in said upstanding position when said receptacle is empty, the rearward rotational movement of said upstanding second plate upon the insertion of said printed matter against the portion of the second plate within said receptacle rotatably removing said support means from said other end of said first plate whereby the weight of said first plate rotates said first plate about its pivotal axis to a pendant visible position.

3,960,317

MAIL BOX WITH SIGNAL ATTACHMENT

James H. Clement, 1635 Rocky Mountain Ave., Milpitas, Calif. 95035

Filed Feb. 18, 1975, Ser. No. 550,833
Int. Cl.² B65D 91/00
U.S. Cl. 232—35 **11 Claims**



10. A mail box comprising:

a. a receptacle in which mail is deposited, said receptacle being formed with an opening through which mail is deposited into said receptacle;

b. a door pivotally mounted on said receptacle, said door being movable between a position to close said opening and a position to open said opening;

c. a bracket fixed to said door for movement therewith;

d. a tubular signal arm carried by said bracket for pivotal movement and movable by said bracket in response to said door being moved between said positions, said bracket including a pivot support for freely supporting said tubular signal arm, said pivot support being disposed intermediate the ends of said tubular signal arm and extending radially through said tubular arm for pivotally mounting said tubular signal arm to said bracket; and

e. a spheroid located on each side of said pivot support for free movement in said tubular signal arm,

said bracket including a stop for limiting the pivotal movement of said tubular signal arm in one direction,

said door being hinged to said receptacle along the lower edge of said door for pivotal movement,

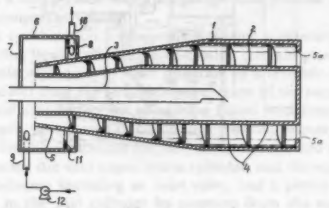
said spheroids urge said tubular signal arm in said one direction into engagement with said stop when said door is closed and said tubular signal arm is initially at an inclined position from its signal end portion to its opposite end, said stop being in the vicinity of said opposite end of said tubular signal arm, said movement of said door from said closed position to said open position moves said bracket to carry said tubular signal arm into a horizontal position and the continued movement of said door to said opened position moves said spheroids to urge said tubular signal arm to move in an opposite direction into a declining position from said signal end of said tubular signal arm to said opposite end of said tubular signal arm and thence into said generally upright signal position, said spheroids maintaining said tubular signal arm in said generally upright position after said door is returned to its closed position.

3,960,318

CENTRIFUGAL SEPARATOR

Bengt Ingmar Dahlberg, Uttran, Sweden, assignor to Alfa-Laval AB, Tumba, Sweden

Filed Sept. 30, 1974, Ser. No. 510,469
Claims priority, application Sweden, Oct. 1, 1973, 7313303
Int. Cl.² B04B 7/04, 11/02
U.S. Cl. 233—4 **2 Claims**



1. A centrifugal separator comprising a rotor for receiving a mixture of liquid and solids and having outlets for discharging separated solids during operation of the rotor, a stationary chute extending around the rotor and positioned in front of said outlets to receive and convey the discharged solids, means for supplying flushing liquid to the chute, and means forming an overflow outlet of the chute and coacting with said supply means to provide in the chute a layer of liquid of a thickness determined by said overflow outlet and rotating around said rotor, said supply means being operable to supply liquid to the chute in an amount sufficient to cause said discharged solids to be dispersed in the liquid and to depart together with the liquid over said overflow outlet, said chute being formed by a cylindrical housing having annular end walls, the housing also having an annular partition wall located between said end walls and having less radial extension than one of said end walls, the chute being located between said one end wall and the annular partition wall, the housing having an outlet between said partition wall and the other end wall.

3,960,319

CENTRIFUGAL SEPARATOR

Francis B. Brown, La Crescenta, and John W. Erickson, Huntington Beach, both of Calif., assignors to Kobe Inc., Huntington Park, Calif.

Filed Oct. 21, 1974, Ser. No. 516,380
Int. Cl.² B04B 1/12, 7/04, 11/02
U.S. Cl. 233—19 R **16 Claims**

1. In a centrifugal separator for a mixture which may include oil, water, gas and/or solids, the combination of:

a. housing means;

b. a rotor rotatable in said housing means and having an inner rotor chamber and an outer rotor chamber encircling said inner rotor chamber;

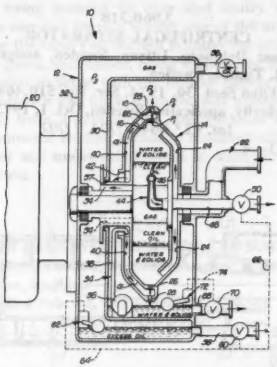
c. mixture delivery means for delivering the mixture to said inner rotor chamber;

d. the periphery of said inner rotor chamber having discharge ports communicating with said outer rotor chamber;

e. the periphery of said outer rotor chamber having discharge ports communicating with said housing means;

f. water supply means for delivering water to said outer rotor chamber at a rate at least equal to the discharge capacity of said discharge ports in said outer rotor chamber at a given rotor speed;

g. an annular weir on the outer rotor chamber for discharging excess water from the outer rotor chamber so that the



outer rotor chamber remains filled to the radius of the weir so as to maintain a substantially constant pressure in said outer rotor chamber adjacent said discharge ports at said given rotor speed; and

g. oil discharge means for removing oil from said inner rotor chamber under pressure.

3,960,320

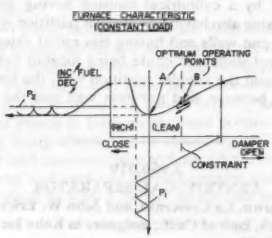
COMBUSTION OPTIMIZER

Billy Ray Slater, Richardson, Tex., assignor to Forney Engineering Company, Carrollton, Tex.

Filed Apr. 30, 1975, Ser. No. 573,279

Int. Cl.² G05D *23/20*; G05B *24/02*; F23N *1/02, 5/24*

U.S. Cl. 236—15 B **12 Claims**



1. An improved process control and optimizer for regulating at least one parameter for the process relative to optimal utilization of available energy wherein temperature responsive open loop control means regulates fuel flow and the optimizer is operatively responsive to the fuel flow for regulating air flow for combustion thereof such that the fuel air mixture is minimized in accordance with optimum operating characteristics for a selected temperature of the process wherein the improvement comprises:

means for delivering digital output representative of the change of fuel flow for governing the air mixture in accordance with said optimum characteristic of the process, and means responsive to said output for decreasing air at a selected first relatively slow rate and increasing air at a relatively faster second rate, corresponding to respective reductions and increases in fuel flow about a selected optimum operating point.

3,960,321

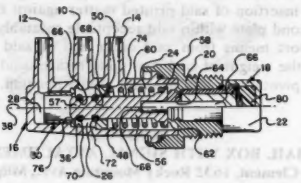
TEMPERATURE RESPONSIVE VALVE

Everett T. Steele, Jr., Knoxville, Tenn., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Jan. 20, 1975, Ser. No. 542,622

Int. Cl.² G05D *23/12*

U.S. Cl. 236—100 **4 Claims**



1. A temperature responsive valve comprising:

a valve body having open and closed ends, the interior surface means of the valve body defining a chamber between its ends in open communication with the open end of the valve body,

a series of three spaced ports connected to said valve body between its ends, each one of said ports of said series being in communication through the chamber of said valve body with the other ports of said series,

a thermostatic power element secured to the open end of said valve body and having more than one position at predetermined temperature levels for controlling the operation of said valve,

a first valve seat means having an opening and being affixed to certain surface means of the interior surface means of said valve body adjacent its closed end and in the chamber thereof,

a second valve seat means having an opening and being affixed to other surface means of the interior surface means of said valve body in the chamber thereof, said second valve seat means being interposed between and spaced from said first valve seat means and the open end of said valve body,

a valve stem means one end of which is connected to said thermostatic power element and the free end of which protrudes through the opening of said second valve seat means and into the opening of said first valve seat means,

the outer peripheral surface portions of said valve stem means at its free end including first and second annular groove means spaced from each other and interposed between and spaced from said first and second valve seat means,

first and second rings of resilient material disposed in said first and second groove means and being arranged to extend in a direction radially outward of both the outer peripheral surface portions of said valve stem means and the outer radial extent of either one of the openings of said first and second valve means,

one end of said first valve seat means having an annular beveled surface facing in a direction towards the open end of said valve body, and beveled surface being sealingly engaged by said first ring when said power element is in another position at another predetermined temperature level for controlling the operation of said valve, and

spring means interposed between said valve stem means and said second valve seat means for urging said valve stem means in a direction towards the open end of said valve body in order to effect positive sealing engagement between said second ring and said second valve seat means while at the same time to effect disengagement between said first ring and said first valve seat means thereby

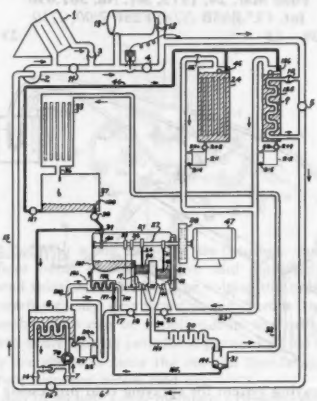
establishing open flow intercommunication between one and another ports of said series when said power element is in one position at a predetermined temperature level for controlling the operation of said valve.

3,960,322

SOLAR HEAT PUMP

John D. Ruff, 206 Birch St., and Phillip R. Wheeler, 209 Pine St., both of Alexandria, Va. 22305

Filed Dec. 17, 1974, Ser. No. 533,630
Int. Cl.[2] F25B 27/00
U.S. Cl. 62—2 13 Claims



1. In combination, means of circulating a primary flow of circulating liquid, and means of heating the said primary flow of circulating liquid by solar radiation to a sensible temperature greater than the sensible temperature of the outside heat sink, and a boiler means of causing liquid refrigerant to boil to a vapor, and means of controlling the said primary flow of circulating liquid to heat the said boiler means, and means of introducing the said vapor into a cylinder, and the said means of introducing including an inlet valve, and a piston which is moved in the said cylinder by pressure from the said vapor when the said pressure is adequate to cause this movement, and means of connecting the said piston to a crankshaft so that the movement of the said piston under the influence of the said pressure causes rotation of the said crankshaft in the function of a heat engine, and means of exhausting the said vapor from the said cylinder to a condenser cooled by the outside heat sink, and means of injecting liquid refrigerant from the said condenser into the said boiler, and an evaporator in which refrigerant liquid evaporates at a sensible temperature lower than the sensible temperature of the outside heat sink, and means of introducing liquid refrigerant into the said evaporator from the said condenser, and means of coupling the said crankshaft to drive a positive displacement compressor means of drawing refrigerant vapor from the said evaporator, and means of discharging the vapor compressed by the said positive displacement compressor means into the said condenser, and means of circulating a fluid medium to contact the said evaporator so that the said fluid medium receives a cooling effect from the said evaporator, and means of circulating the said fluid medium to cool the inside of a building, and an electric motor means of driving the said crankshaft, and means of automatically controlling the said electric motor means to provide motive power to start the motion of the said function of a heat engine, and means of automatically controlling the said electric motor means to provide motive power to drive the said positive displacement compressor means when the said cooling effect is required to cause cooling of the said inside of a building during times when the sensible temperature in the said boiler means is too low for the said function of a heat engine to provide sufficient power to drive the said compressor means fast enough to provide the said cooling effect in sufficient quantity to keep the said inside of a building cooled to a pre-determined sensible temperature, and valve means of shutting off flow of vapor from the said boiler means to the said cylinder during the said times when the sensible temperature in the said boiler means is too low, and valve means of conducting vapor flow from the said evaporator through the said inlet valve into the said cylinder during the said times when the sensible temperature in the said boiler means is too low, so that the said piston is driven by the said crankshaft to move in the said cylinder in the alternate function of a compressor which assists the said positive displacement compressor means.

7. In combination, means of circulating a primary flow of circulating liquid, and means of heating the said primary flow of circulating liquid by solar radiation to a sensible temperature greater than the sensible temperature of the outside heat sink, and a boiler means of causing liquid refrigerant to boil to a vapor, and means of controlling the said primary flow of circulating liquid to heat the said boiler means, and means of introducing the said vapor into a cylinder, and the said means of introducing including an inlet valve, and a piston which is moved in the said cylinder by pressure from the said vapor when the said pressure is adequate to cause this movement, and means of connecting the said piston to a crankshaft so that the movement of the said piston under the influence of the said pressure causes rotation of the said crankshaft in the function of a heat engine, and the inside of a building maintained at a sensible temperature higher than the sensible temperature of the outside heat sink, and a condenser in which condensing occurs at a sensible temperature higher than the sensible temperature of the said inside of a building, and means of exhausting the said vapor from the said cylinder to the said condenser, and means of injecting liquid refrigerant from the said condenser into the said boiler means, and an evaporator in which refrigerant liquid evaporates at a sensible temperature lower than the sensible temperature of the outside heat sink, and means of transferring heat from the outside heat sink to the said evaporator to provide latent heat of vaporization, and means of introducing liquid refrigerant into the said evaporator from the said condenser, and means of coupling the said crankshaft to drive a positive displacement compressor means of drawing refrigerant vapor from the said evaporator, and means of discharging the vapor compressed by the said positive displacement compressor means into the said condenser, and means of circulating a fluid medium to contact the said condenser so that the said fluid medium receives a heating effect from the said condenser, and means of circulating the said fluid medium to heat the said inside of a building, and an electric motor means of driving the said crankshaft, and means of automatically controlling the said electric motor means to provide motive power to start the motion of the said function of a heat engine, and means of automatically controlling the said electric motor means to provide motive power to drive the said positive displacement compressor means when the said heating effect is required to cause heating of the said inside of a building during times when the sensible temperature in the said boiler means is too low for the said function of a heat engine to provide sufficient power to drive the said compressor means fast enough to provide the said heating effect in sufficient quantity to keep the said inside of a building heated to a pre-determined sensible temperature, and valve means of conducting vapor flow from the said evaporator through the said inlet valve into the said cylinder during the said times when the sensible temperature in the said boiler means is too low, so that the said piston is driven by the said crankshaft to move in the said cylinder in the alternate function of a compressor which assists the said positive displacement compressor means.

3,960,323

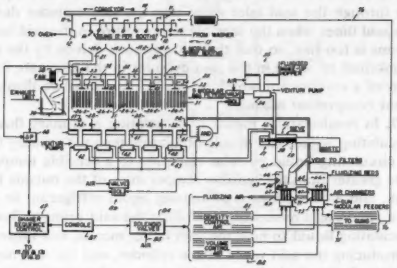
POWDER SPRAY SYSTEM

Lane S. Ducan, Elyria; Simon Z. Tamny, Lorain, and Charles H. Riedy, Lakewood, all of Ohio, assignors to Nordson Corporation, Amherst, Ohio

Division of Ser. No. 259,591, June 6, 1972, Pat. No. 3,870,375, Continuation-in-part of Ser. No. 194,830, Nov. 2, 1971, Pat. No. 3,746,254. This application Oct. 24, 1974, Ser. No. 517,445

Int. Cl.² B05B 5/02

U.S. Cl. 239—3 5 Claims



1. In an electrostatic powder spray system having an electrostatic spray device which electrostatically charges the powder being sprayed therefrom and having a powder feeder for supplying an air-powder mixture to said spray device, said feeder having an output line connected to said spray device through which said mixture is so supplied, the improvement for removing from the particles of powder electrostatic charge which is opposite from that imposed by said spray device comprising:

an electrical conductor means 75 positioned upstream of said electrostatic spray device adjacent said powder feeder to contact powder passing through said line and electrically biased with respect to said electrostatic spray device so as to discharge said powder with respect to said device before said powder is electrostatically charged at said device.

3,960,324

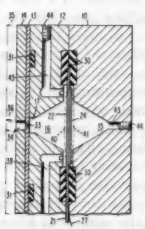
METHOD FOR GENERATION OF MULTIPLE UNIFORM FLUID FILAMENTS

Donald E. Titus, Endicott, and Sherman H. M. Tsao, Apalachin, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 432,260, Jan. 10, 1974, Pat. No. 3,900,162. This application May 29, 1975, Ser. No. 582,065

Int. Cl.² B05B 17/06

U.S. Cl. 239—4 6 Claims



1. The method of generating droplets of fluid comprising the steps of:

producing a set of fluid filaments by forcing a fluid simultaneously through an array of orifices spaced along a fixed plate in a cavity; and

breaking said filaments up into droplets by successively generating a single uniform drop stimulating pressure wave by simultaneous actuation of a plurality of bending elements on a bending member in said cavity.

3,960,325

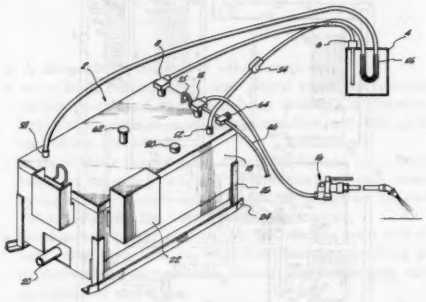
PORTABLE HEATING AND SPRAYING APPARATUS AND METHOD FOR APPLYING HIGHLY VISCOUS COATING MATERIAL

James O. Nienow, West Covina, and Deryl S. Yundt, La Canada, both of Calif., assignors to Roofmaster Inc., Monterey Park, Calif.

Filed Mar. 24, 1975, Ser. No. 561,090

Int. Cl.² B05B 1/24; F28F 7/00, 1/10

U.S. Cl. 239—13 23 Claims



1. A spraying system for spraying cold processing roofing material from a reservoir comprising:

a tank adapted to hold a fluidic heat transfer medium;

means for supplying heat to the tank to heat the heat transfer medium;

a serrated finned heat transfer coil mounted within the tank including a plurality of loop sets of tubing, at least a pair of tubing sets positioned apart by at least one spacer member, the spacer member attached to only one of the set of loops to permit relative movement between the pair of tubing sets;

a pump connected to the reservoir and to one end of the serrated finned heat transfer coil; and

spraying means connected to the other end of the heat transfer coil for distributing the cold processing roofing material to a surface to be coated, the fluidic heat transfer medium substantially surrounding the serrated finned heat transfer coil to effectuate a controlled, even heat transfer to the cold processing roofing material as it is pumped from the reservoir through the serrated finned heat transfer coil to the spraying means.

3,960,326

APPARATUS FOR PAINT APPLICATION

Yoshio Nishiumi, Tokyo, and Yukio Nagasaka, Kawagoe, both of Japan, assignors to Atom Chemical Paint Co., Ltd., Tokyo, Japan

Filed Jan. 6, 1975, Ser. No. 538,966

Claims priority, application Japan, Sept. 5, 1974, 49-106090

Int. Cl.² B05B 3/02

U.S. Cl. 239—214 5 Claims

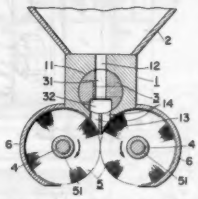
1. An apparatus for applying paint, comprising:

a tank for holding paint;

an elongated paint supply means having inlet passage means at its upper end for receiving paint from said tank, two elongated parallel rows of longitudinally spaced-apart

discharge orifices at the lower end of said paint supply means for discharging paint therefrom, said rows being transversely spaced from each other and extending in the longitudinal direction of said paint supply means, and a movable valve located between said inlet passage means and said rows of discharge orifices for controlling flow of paint from said inlet passage means to said discharge orifices;

a pair of parallel, elongated, rotatable, cylindrical, wire brushes disposed directly below and whose axes of rotation extend longitudinally of said paint supply means and said rows of discharge orifices, said brushes being disposed in radially opposed, adjacent relationship and being adapted to be rotated in opposite circumferential directions, the downwardly moving peripheral portions of the brushes being disposed in confronting relationship



and defining a nip between the brushes, said rows of orifices being disposed above said nip and in closely spaced relation to the brushes so that the brushes move circumferentially downwardly and across the orifices whereby paint can be supplied from the orifices to the downwardly moving peripheral portions of the brushes as they are about to enter the nip and thence applied to a surface disposed below said nip;

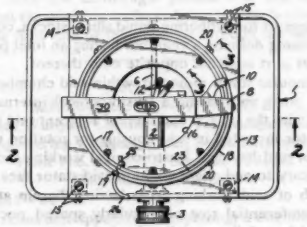
and a pair of arcuate cover members extending downwardly from said paint supply means and respectively covering the mutually remote, upwardly movable peripheral portions of the brushes, each of said cover members having a sharp edge at the inner lower end thereof, said edge being disposed directly under the lowermost point on its associated brush and in substantially touching relationship therewith to remove paint that sticks to the periphery of its associated wire brush.

3,960,327

LAWN SPRINKLER PROGRAMMER

Richard A. Olson, 3641 Larchwood Circle, Minnetonka, Minn. 55343

Filed Feb. 6, 1975, Ser. No. 547,486
Int. Cl.² B05B *3/08*; F16H *53/00*
U.S. Cl. 239—236 **7 Claims**



1. A programmer for a sprinkler, said sprinkler including, support means, a body rotatively mounted on said support means on a generally vertical axis and having a discharge nozzle, mechanism effecting turning of said body, and a movable discharge guide element mounted on the body for turning movement therewith and movable relative to the body for controlling the elevation of discharge of water from said nozzle; said programmer comprising:

a. a circumferentially extended stationary cam of flexible material having a variable cam surface contour;

b. cam mounting means for mounting said cam on said support means in encompassing relationship to said body and supporting said cam in selected contours of said variable cam surface thereof, said cam mounting means defining an annular channel for reception of said cam, said channel having side walls frictionally engaging and holding said cam therebetween;

c. and a cam follower adapted to be connected to said discharge guide element for movements therewith and engaging said cam to impart elevation control movements to said guide element responsive to turning movements of said body, said cam follower being freely movable in said channel in engagement with said cam.

3,960,328

DISHWASHING MACHINE AND ROTARY SPRAYER THEREFOR

Jean Archambault, 500 Francois St., Apt. 207, Nuns' Island, Quebec, Canada

Filed Nov. 18, 1974, Ser. No. 525,029
Int. Cl.² B05B *3/00*
U.S. Cl. 239—264 **7 Claims**

1. A rotary sprayer, for use in a dishwashing machine and the like, comprising a hollow bar rotatable about a rotation axis extending through the longitudinal center thereof, defining a pair of axial walls relative to said rotation axis, said bar having a longitudinal axis extending transversely of said rotation axis, outwardly projecting bulges formed by one of said axial walls, staggered one from the next and in disalignment one from another in the direction of said longitudinal axis, each bulge having a slot at the outer portion thereof, the slots extending substantially parallel one to another on each side of said rotation axis.

3,960,329

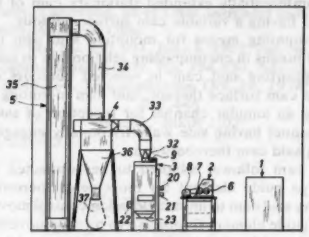
METHOD AND APPARATUS FOR PURIFYING AND SEPARATING BEE GLUE

Karl Lund Aagaard, Vestergade 63, 3200 Helsinge, Denmark

Filed Dec. 16, 1974, Ser. No. 532,935
Claims priority, application Luxembourg, Jan. 3, 1974, 69108
Int. Cl.² B02C *21/00*
U.S. Cl. 241—23 **5 Claims**

1. A method for purifying and separating bee glue (propolis) which is derived from beehives, comprising providing raw propolis and storing said propolis at temperatures below −10°C for a period of time sufficient to substantially destroy living organisms and larvae contained in said propolis; allowing the propolis to defrost at temperatures of about 20°C and maintaining said propolis at said temperature to allow the development of viable eggs of said larvae; refreezing said propolis for a period of time sufficient to destroy all viable organisms; crushing said propolis, wherein said propolis is

maintained at a temperature of about 0° during said crushing, to produce grains of propolis having a maximum diameter of



6 mm; sorting and fractionating said crushed propolis, which is maintained at 0°C, according to grain size.

3,960,330

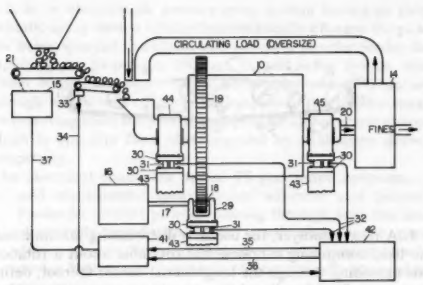
METHOD FOR MAXIMIZING THROUGHPUT IN AN ORE GRINDING SYSTEM

Howard K. Henson, 1134 E. Lester, Tucson, Ariz. 85719

Filed June 21, 1974, Ser. No. 481,539

Int. Cl.² B02C *25/00*

U.S. Cl. 241—30 **5 Claims**



1. A process for maximizing ore throughput and optimizing performance in an ore grinding system comprising the steps of weighing the ore grinding system including the drive means, weighing the new ore input to the ore grinding system, determining an optimum maximum set point weight for the ore grinding system by comparing the weight of the ore grinding system over a plurality of time periods, comparing the weight of the new ore input over a plurality of time periods, determining the ore grinding system weight set point in accordance with the difference in the ore grinding system weights and the new ore feed weights over the plurality of time periods, and regulating said new ore input such as to maintain the ore grinding system at said optimum set point weight.

3,960,331

SANDMILL

Edward J. Szkaradek, Santa Ana, Calif., assignor to Morehouse, Industries, Inc., Fullerton, Calif.

Filed Dec. 4, 1974, Ser. No. 529,409

Int. Cl.² B02C *17/02*

U.S. Cl. 241—43 **3 Claims**

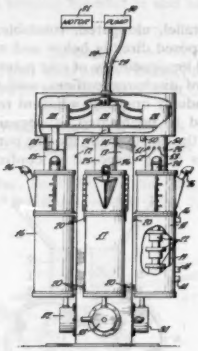
1. Sandmilling apparatus comprising:

a central support column having a hollow interior;

a plurality of separate, cylindrical sandmill processing vessels each having an interior cylindrical wall and each separately supported respectively on one of a plurality of sides of the exterior of the column spaced around the column with one side having no vessel thereon and being available for access to the hollow interior of the column;

each said vessel having an inlet and an outlet;

means for continuously pumping material to be processed in the inlet of each vessel, through the vessel, and out the outlet;



a rotor in each of said vessels with a drive shaft extending outwardly from the vessel; and

means supported on said column for independently driving each of said rotor drive shafts.

3,960,332

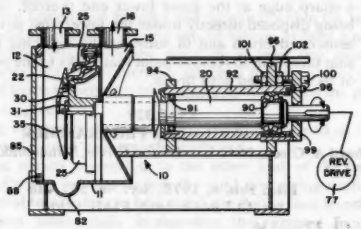
DEFIBERING APPARATUS FOR PAPER MAKING STOCK

Peter Seifert, Middletown, Ohio, assignor to The Black Clawson Company, Middletown, Ohio

Filed Oct. 23, 1974, Ser. No. 517,330

Int. Cl.² B02C *7/06, 7/12*

U.S. Cl. 241—46.06 **23 Claims**



1. Apparatus for defibering liquid slurry stocks, comprising:

a. a housing defining a chamber having an inlet port and an outlet port adjacent opposite ends thereof,

b. an annular stator mounted within said chamber between said ports and having a frusto-conical internal working face with the smaller end thereof adjacent said inlet port,

c. a rotor mounted in said housing for rotation within said stator and having a frusto-conical working face complementary to and aligned within said stator face,

d. each of said working faces having therein at least one circumferential row of angularly spaced pockets separated by axially extending land areas,

e. each of said pockets in said rotor having generally axially extending side walls and a generally radially extending back wall cooperating with portions of said land areas on said rotor face to form a circumferential land,

f. each of said pockets in said stator having generally axially extending side walls and a generally radially extending

front wall cooperating with portions of said land areas on said stator face to form a circumferential land, and

g. the axial dimensions of said pockets and of said rotor and stator being of predetermined relationship locating said circumferential lands thereon in axially staggered relation with each other and in radially opposed relation with said stator and rotor pockets respectively to force the stock to travel back and forth between said pockets in flowing from said inlet port to said outlet port.

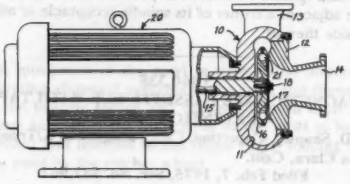
3,960,333
FLUIDIC MILL

Verle W. Woods, and Jay A. Woods, both of P.O. Box 1016, Yakima, Wash. 98907

Continuation-in-part of Ser. No. 387,795, Aug. 13, 1973, abandoned. This application Dec. 12, 1974, Ser. No. 532,019

Int. Cl.² B02C *15/08*

U.S. Cl. 241—46.15 **9 Claims**



1. A fluidic mill for pumping a fluid material carrying solid particles through the mill and grinding the solid particles as the material is pumped through the mill, comprising:

an annular outer race rotatable about a center axis;

said outer race having two axially spaced annular grinding surfaces inwardly facing the center axis;

a plurality of grinding ball means arranged about the outer race in rolling contact with said grinding surfaces;

means operatively connected to the outer race for rotating the outer race in a desired rotational direction about the center axis;

each of said ball means being mounted to freely rotate in the same direction as the outer race about the center axis;

operative means in open communication through the annular race intermediate the grinding surfaces for permitting passage of material radially outward through the race;

means for directing said fluid material into the mill and directing the fluid material centrifugally outward against the ball means and between the ball means and the grinding surfaces and through the aperture means, thereby retarding the rotational movement of the ball means in the desired rotational direction about the center axis in proportion to the flow rate of the material through the mill, with the centrifugal pressure of the ball means against the grinding surfaces being inversely proportioned to the flow rate of the material through the mill.

3,960,334
SIZE REDUCTION APPARATUS

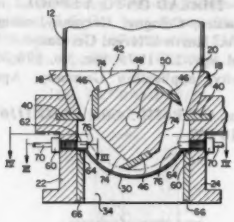
Joseph Paul Wudyka, Cumberland, R.I., assignor to Cumberland Engineering Company, Inc., South Attleboro, R.I.

Filed Feb. 24, 1975, Ser. No. 552,662

Int. Cl.² B02C *23/20*

U.S. Cl. 241—60 **10 Claims**

1. Size reduction apparatus comprising, a chamber, a rotor mounted within said chamber for rotation about an axis, means for driving said rotor about said axis, cutting means affixed on said rotor, bed knife means situated for cooperative cutting relationship with said cutting means as said rotor is driven to effect size reduction of material fed into said chamber, screen means forming at least a portion of a boundary of said chamber, said screen means serving to permit discharge from said chamber of said material after reduction thereof to a predetermined size, and means positioned below the axis of



rotation of said rotor for producing a positive fluid flow in said chamber.

3,960,335
COMMINUTION DEVICE FOR SCRAP PLASTICS

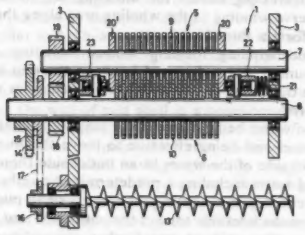
Wilhelm Häberle, Industriegelande, Scheer, Wurttemberg, Germany

Continuation of Ser. No. 316,442, Dec. 19, 1972, abandoned. This application Nov. 5, 1974, Ser. No. 520,930

Claims priority, application Germany, Dec. 24, 1971, 2164566

Int. Cl.² B02C *18/14, 18/26*

U.S. Cl. 241—236 **4 Claims**



1. A comminution device for the conversion of scraps of plastic such as thermoplastically moldable foils or blow mold particles into a free-flowing, granulated material, said scraps being fed into said device in one direction, said device comprising:

a housing;

a knife and driving shaft assembly including a first shaft journalled for rotation in said housing, and

a first plurality of axially spaced apart knives mounted on said first shaft for rotation together therewith; and

a counterknife assembly including

a second shaft journalled for rotation in said housing, and

a second plurality of axially spaced apart knives mounted on said second shaft for rotation together therewith, the periphery of said first plurality of knives being disposed between and radially inward of the periphery of said second plurality of knives whereby said first and said second plurality of knives are cooperatively associated with each other for cutting the plastic; and

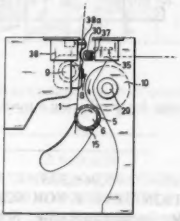
further including a cutting tool and

an impact knife cooperating therewith, said cutting tool and said impact knife being rotatable about an axis that is perpendicular to the feed direction of the foil or blow mold particles.

3,960,336
APPARATUS FOR FORMING A WASTE WINDING ADJACENT A RESERVE WINDING WHEN WINDING A THREAD ONTO A SPOOL

Alfred Tschentscher, Cologne, Germany, assignor to FMN Schuster & Co., Hurth-Efferen, Germany

Filed Apr. 22, 1975, Ser. No. 570,312
Claims priority, application Germany, Apr. 27, 1974, 2420564
Int. Cl.² B65H *54/02*; D02G *1/16*
U.S. Cl. 242—18 PW **6 Claims**



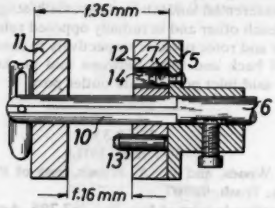
1. An apparatus for initially winding a thread onto a spool core having a thread package winding area, said apparatus comprising:
   a. means for forming a waste winding at an end location of the spool core,
   b. means for forming a reserve winding at said end location adjacent said waste winding, and
   c. a traversing device for directing the thread from the reserve winding to the winding area along the spool core to form a thread package,
   d. said winding forming means including a rotatably mounted worm disposed between the end location and the traversing device and a drive means for rotating said worm,
   e. said worm being disposed for tangential contact with the thread and being effective to move the thread from an inlet side of the worm to an outlet side thereof,
   f. said worm including a predetermined number of circumferential grooves having a relatively small pitch extending from the inlet side toward the outlet side and immediately thereafter at least one further circumferential groove having a larger pitch,
   g. said small pitch circumferential grooves being effective to form said waste winding immediately preceding the formation of said reserve winding formed while the thread moves through the larger pitch circumferential groove until the thread runs off the outlet side of the worm body.

3,960,337
OFFSET DRIVE PIN ADAPTORS FOR FILM PROJECTORS, FILM SPOOLS, AND 35MM TO 16MM CONVERTERS

Karl-Heinz Schroeder, Selent, and Herbert Tuemmel, Kiel, both of Germany, assignors to Zeiss Ikon AG, Germany

Filed Oct. 1, 1974, Ser. No. 510,895
Claims priority, application Germany, Nov. 22, 1973, 2358224
Int. Cl.² B65H *17/02*, *75/18*
U.S. Cl. 242—68.3 **8 Claims**

1. A motion picture film spool drive comprising:
   a substantially-square spindle having an axis, four corners, four sides, and an end;
   a flange affixed to said spindle at said end;
   a first drive pin aperture in said flange parallel to but offset from said spindle axis on a radius of the flange passing through one of said spindle corners;
   a second drive pin aperture in said flange parallel to but offset from said spindle axis on a radius of the flange passing normal to one of said spindle sides; and

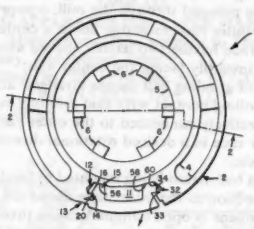


   a drive pin selectively mountable in either of said first or second drive pin apertures and projecting from said flange parallel to said spindle for driving a spool mounted on said spindle whether said spool has a drive pin receptacle adjacent a corner of its spindle receptacle or adjacent a side thereof.

3,960,338
MAGNETIC TAPE CASSETTE HUB WITH TAPE RETENTION MEANS

Bruce D. Shapley, Cupertino, Calif., assignor to K/Tronic Inc., Santa Clara, Calif.

Filed Feb. 7, 1975, Ser. No. 547,967
Int. Cl.² B65H *75/28*
U.S. Cl. 242—74.1 **7 Claims**



1. In a tape hub having a hub body member and a latching member with means for latching the latching member to said body member for securing tape in a cavity in said body member, the improvement comprising:
   a first member having a facing surface protruding from said body member;
   a second member having a facing surface protruding from said latching member;
   a means for positioning said first and said second members in an overlapping relationship; and
   a means applying a tensile force to said second member protruding from said latching member for drawing together said facing surface of said second member and said facing surface of said first member when said members are in said overlapping relationship, said drawing together serving to retain tape between said facing surfaces.

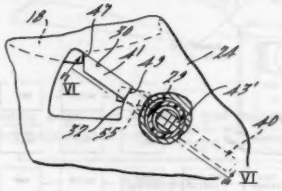
3,960,339
SEAT BELT RETRACTOR

Robert C. Fisher, 580 E. Long Lake Road, Bloomfield, Mich. 48013

Filed Aug. 26, 1974, Ser. No. 500,582
Int. Cl.² A62B *35/00*
U.S. Cl. 242—107.4 R **8 Claims**

1. A safety belt retractor of the type having a frame, a spool rotatable in the frame, a ratchet wheel rotatable with the

spool, a pawl having a tooth portion engageable with but biased away from the ratchet wheel, and bearing means rockably supporting the pawl in the frame, characterized by portions forming a part of said bearing means yieldable in a direction radial to the axis of rocking movement of the pawl to



permit movement of the pawl in such radial direction, and cooperating abutment portions on the pawl and frame spaced from the bearing means and engageable with each other in response to such radial movement of the pawl to limit such movement and transmit to the frame radial loading imposed on the pawl by the ratchet wheel.

3,960,340

WINCH DRUM PROVIDED WITH SIDE FLANGES AND A SEPARATE FLANGE

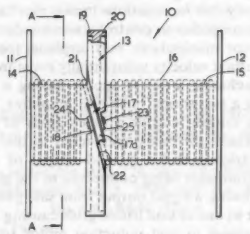
Erling Naas, Brattvag, Norway, assignor to A/S Hydraulik Brattvaag, Norway

Filed Nov. 13, 1974, Ser. No. 523,457

Claims priority, application Norway, Nov. 13, 1973, 4342/73

Int. Cl.² B65H *75/18*

U.S. Cl. 242—117 **3 Claims**



1. In an elongated winch drum having flanges at opposite ends thereof, and a further flange at a location intermediate said opposite ends for separating said drum into two drum segments, a device for guiding hawser during the transfer thereof from one drum segment to the other, said device comprising a disc member mounted on said further flange, there being a slot formed in said further flange at an angle with respect to the main plane of the separating flange, said disc member being received in said slot, said disc member having a grooved edge in which the hawser moves during the transfer thereof.

3,960,341

SPOOL CORE FOR THE WET TREATMENT OF THREADS AND YARNS

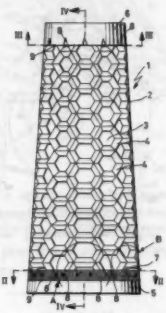
Adam Thelen, Laurensberg, Germany, assignor to Plastic-Fabrik Elbenia GmbH & Co., Inc., Pontsheide, Germany

Filed Oct. 17, 1974, Ser. No. 515,441

Claims priority, application Germany, Dec. 1, 1973, 2360042

Int. Cl.² B65H *75/20*

U.S. Cl. 242—118.1 **4 Claims**



1. A spool core of unitary construction, manufactured, for example, from injection-molded thermoplastic or thermosetting synthetic material, and adapted for the wet treatment, especially the dyeing, of thread or yarn spools, the spool core comprising:

a hollow tubular elongated shell constituting a major central length portion of the spool core;

a foot collar and a head collar adjoining said shell on both axial ends and constituting respective upper and lower axial end portions of the spool core;

a series of radial perforations or cell openings extending through the wall of said shell in a honeycomb pattern so as to reduce the remaining intermediate shell wall portions to a series of intersecting ribs, the intersecting ribs of the spool core shell having a generally triangular cross section, the triangle of said cross section having its base oriented to face radially inwardly, so that its tip faces outwardly, thereby defining the outer diameter of the shell with a honeycomb pattern of narrow ridges; said cell openings widening radially outwardly toward the outer diameter of the spool core shell; and

on at least its axially extending constituent ribs near a collar, means for axially positioning the innermost yarn layers wound thereonto.

3,960,342

TAPE TRANSPORT APPARATUS

Marcel Furst, Sunnyvale, Calif., assignor to American Videonetics Corporation, Sunnyvale, Calif.

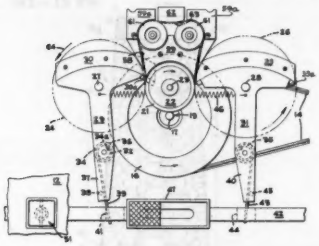
Continuation of Ser. No. 297,499, Oct. 13, 1972, abandoned. This application Oct. 24, 1974, Ser. No. 517,497

Int. Cl.² G03B *1/04;* **G11B** *15/32*

U.S. Cl. 242—192 **2 Claims**

2. In a tape transport apparatus of the type employing a length of pliable record tape wrapped to form supply and take-up rolls, a resilient annular rotating drive body disposed to ride against and drive both the take-up roll and the supply roll, first and second carriage means serving to respectively support said supply and take-up rolls to advance and retreat relative to said body, spring means coupled between and common to both said first and second carriages to draw said carriages together toward the drive body with substantially equal forces applied to each carriage, a first force differential spring of variable force disposed to engage a portion of said

first carriage to directly add its own force to that force of the first named spring means acting upon said first carriage and the roll when feeding the tape in a first direction, a second force differential spring of variable force disposed to engage a portion of said second carriage to directly add its own force to that force of the first named spring means acting upon said second carriage and the roll thereof when feeding the tape in



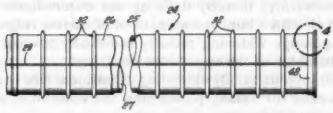
a second direction, and a movable control member selectively translatable between advanced and retracted positions to engage one or the other of said first and second force differential springs in a manner to inhibit the applied force thereof from acting upon its associated carriage and the roll thereof to cause one or the other of said rolls to be urged against said body with a force different from that force urging the other roll against said body.

3,960,343

DOUBLE WALL DUCTING

Harold R. Thompson, Simi Valley, and Ralph A. Anderson, Burbank, both of Calif., assignors to SSP Products, Inc., Burbank, Calif.

Filed Oct. 29, 1974, Ser. No. 518,377
Int. Cl.² B64D *47/00*
U.S. Cl. 244—1 R **18 Claims**



1. For use in jet aircraft, a lightweight, high-strength duct comprising:

two thin annular sheet metal tubes, the tube metals being equivalents, one of said tubes being snugly fitted within the other,

said tubes having substantially continuous cylindrical wall surfaces,

the inner surface of the outer tube being in substantially coextensive contact with the outer surface of the inner tube,

longitudinally spaced stiffening members on the outer tube, said stiffening members being spaced by relatively long expanses of cylindrical wall surface, and

venting means in one of the tubes to prevent pressure differentials between the two tubes at various altitudes and temperatures,

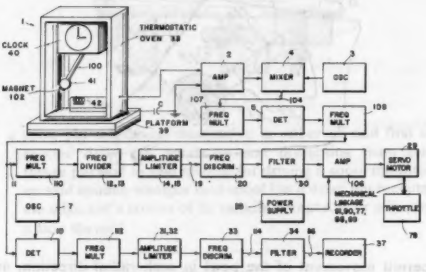
said duct having approximately the same strength as a single wall tube of an equivalent metal weighing twice as much.

3,960,344

PRECISION MOBILE GRAVITY SURVEY AND GUIDANCE SYSTEM

Virgil H. Dugan, 1614 E. 47th St., Chattanooga, Tenn. 37407

Filed July 29, 1974, Ser. No. 492,789
Int. Cl.² B64C *13/18*
U.S. Cl. 244—182 **8 Claims**



1. An apparatus to precision gauge the resultant velocity between the earth spin velocity and an airplane's in air ground speed and to cause a servo- induction motor to automatically vary a speed control for the airplane to maintain said essentially constant the resultant velocity, said airplane being maintained at a practically fixed radial distance to the center of the earth, once the airplane has been positioned in flight; ensuring that the Coriolis force limitation on precision mobile gravity surveys will be substantially overcome; the apparatus further comprising a powered pendulum clock mounted on a stabilized platform and being temperature stabilized, for driving a series of cascaded frequency multipliers being interspersed with amplifiers; said pendulum oscillating at a clock frequency dependent upon said resultant velocity; the apparatus further comprising a guidance channel discriminator having an input connected to said series of cascaded frequency multipliers, to synthesize an error signal in response to variations in said clock frequency due to variations in said resultant velocity, to cause a servo-amplifier to control a servo-induction motor so that said motor manipulates said airplane speed control to hold said resultant velocity substantially constant; said apparatus furthur including a power supply having a power output connected to a two-triode push-pull amplifier, which triodes are biased to current cutoff; a first output of said guidance channel discriminator being connected to the grid of a first one of said triodes and a second output of said guidance channel discriminator being connected to the grid of a second one of said triodes; a signal output from said guidance channel discriminator to one of said triode grids causing the generation of an error signal to said induction motor to correct for a variation in said resultant velocity of the airplane.

3,960,345

MEANS TO REDUCE AND/OR ELIMINATE VORTICES, CAUSED BY WING BODY COMBINATIONS

Joseph Lippert, Jr., Locust Valley, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

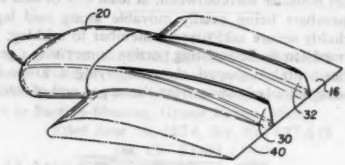
Filed May 16, 1975, Ser. No. 578,199
Int. Cl.² B64C *3/58, 7/02*
U.S. Cl. 244—130 **10 Claims**

5. A wing-body combination comprising:

a wing;

a body attached to said wing, said body having a forward portion extending ahead of said wing; and

channel forming means on an upper surface of said body beginning at the leading edge of said wing and ending at



a trailing edge of said wing, said means being along spaced sides of said body.

3,960,346

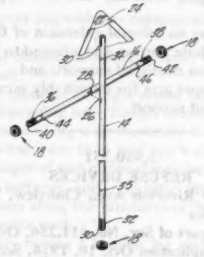
KITE

Jin Sul Cho, G-3040 W. Bristol Road, Flint, Mich. 48507

Filed Jan. 27, 1975, Ser. No. 544,046

Int. Cl.² B64C *31/06*

U.S. Cl. 244—155 A **8 Claims**



1. A kite, comprising:

a. a lightweight sheet material,

b. a support member having the sheet material secured thereto, wherein the support member has a string retaining slot formed at at least one end thereof and

c. means for balancing the weight of the kite comprising a threaded member threadably rotatable positionable on the support member.

3,960,347

ATTACHMENT FOR KITES AND THE LIKE

Gerd O. Stritzke, 15 W. 473 Jefferson St., Bensenville, Ill. 60106

Continuation of Ser. No. 423,276, Dec. 10, 1973, abandoned. This application Apr. 3, 1975, Ser. No. 564,844

Int. Cl.² B64C *31/06*

U.S. Cl. 244—155 R **2 Claims**

1. A device for climbing a kite string and for subsequently descending the string, comprising in combination:

a longitudinally extending member having a longitudinal opening therethrough adapted to receive a kite string;

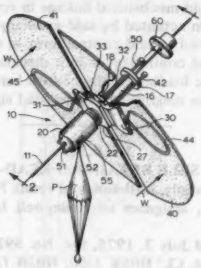
a pair of wings hingedly secured on said member;

said wings adapted to be releasably secured in a position substantially transverse to the axis of the string and to be folded to a position substantially parallel to the axis of the string;

means for releasably locking said wings in said transverse position during ascent of the device on the kite string;

means for inhibiting the rotation of said device about the kite string during ascent, said means comprising each of said wings being formed in a semi-circular shape whereby together in the transverse position they form a substantially aerodynamically stable circular wing area;

means for releasing said wings from said transverse position upon the engagement of a stop on the kite string; and



means including a spring member mounted substantially coaxial to said longitudinal opening for holding said wings in said transverse position during the ascent and in said parallel folded position during the descent of the device on the kite string.

3,960,348

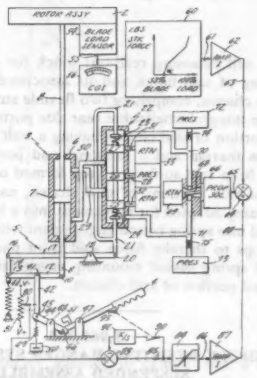
AERODYNAMIC SURFACE CONTROL FEEL AUGMENTATION SYSTEM

Donald W. Fowler, West Haven, and Sean J. O'Connor, Bristol, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Aug. 4, 1975, Ser. No. 601,815

Int. Cl.² B64C *13/46*

U.S. Cl. 244—83 D **3 Claims**



1. A system for positioning a control surface of an aircraft comprising:

means for sensing the aerodynamic loading of at least one control surface and providing a load signal in response thereto;

a hydraulic actuator, including a piston for positioning the control surface, and having a servo valve for positioning said piston in response to fluid pressure;

a control lever;

mechanical linkage interconnected between said control lever, said servo valve and said piston in a fashion such that the motion of said control lever to a given position causes said mechanical linkage to actuate said servo valve which drives said piston to reposition the control surface, and to return said mechanical linkage to a null position to deactivate said servo;

auxiliary valve means responsive to said load signal for actuating said servo valve independently of said mechanical linkage; and

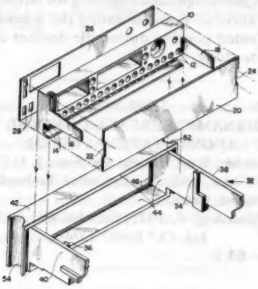
means connected to said mechanical linkage to induce a force into said mechanical linkage in response to motion of said piston actuated by said auxiliary valve, said force being imparted to said control lever in such a manner as to move said control lever in a direction to reduce the aerodynamic loading of the control surface and thereby to reduce the magnitude of said load signal.

3,960,349

INTEGRAL, SELF RETAINING READ-OUT BLOCK

Edward A. Schierholz, Littleton, and Frank Nardi, Englewood, both of Colo., assignors to Honeywell Inc., Minneapolis, Minn.

Filed July 3, 1975, Ser. No. 592,772
Int. Cl.² H05K *5/00*; H02B *1/62*
U.S. Cl. 248—27 R **5 Claims**



1. A self retaining read-out block for effecting a secure mounting of said block and its associated front panel on a module chassis, comprising two flexible strips each forming a separate integral extendable rear side portion of said block, a front portion of said chassis having a wall surface that forms a recess therein and a marginal end portion extending inwardly from said surface, a stop formed on each one of two opposite side portions of said chassis, each of said flexible strips being adapted for movement into a bowed shaped position and into spring biased engagement with a different one of said stops to thereby force said front panel and block into stacked spring biased mounting engagement with said marginal end portion of said chassis.

3,960,350

SHOCK-RESISTING HANGER SYSTEMS AND SUSPENDED ASSEMBLIES

Louis V. Tardoskegyi, Montreal, Canada, assignor to Electrovert Ltd., Montreal, Canada

Filed Nov. 27, 1973, Ser. No. 419,376
Int. Cl.² F16L *3/00*
U.S. Cl. 248—54 R **9 Claims**

1. A shock-resisting hanger system which comprises:

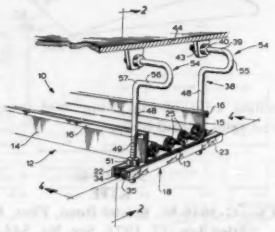
a support member intended to be disposed in supporting relationship to a structure to be suspended by said hanger system and including a terminally slotted web including mutually spaced apart flanges defining an open ended slot, opposed edges of said mutually spaced apart flanges at an end of said support member being terminally and upwardly upset; and

a hanger in turn comprising a rod having:

a substantially straight leg removably received in said slot inwardly of said end portions of said flanges and having an upper end and a lower free end;

upper and lower mutually spaced apart locking members on said leg adjacent the free end thereof and receiving said support member therebetween, at least one of said locking members being axially movable along said leg to detachably secure said support member to said leg;

an intermediate shock-resisting portion comprising a generally horizontal U-shaped element having a lower limb extending annularly away from the upper end of said leg,



an upper limb spaced from said lower limb and a curved base web merging smoothly into said upper and lower limbs;

an arm comprising an integral extension of the upper limb of the intermediate portion and adapted to be received in an opening in an overhead support; and

means on said upper arm for detachably securing said arm to said overhead support.

3,960,351

REFUSE DEVICES

Chris Coetzee, 199 Riverton Ave., Clubview, Verwoerdburg 0140, South Africa

Continuation-in-part of Ser. No. 411,256, Oct. 31, 1973, abandoned. This application Oct. 10, 1974, Ser. No. 513,589
Int. Cl.² A47G *29/06*; B65F *1/06*
U.S. Cl. 248—101 **4 Claims**

1. Supporting device for a disposable refuse pocket of a flexible material having an open mouth, said supporting device comprising a supporting frame adapted for the releasable attachment of the edge of the mouth of the pocket, said supporting frame comprising a first, stationary supporting member and a second movable supporting member, each of the supporting members comprises a pair of arms and an interconnecting cross strut, said cross struts being adapted for the attachment thereto of a part of the mouth of the pocket, corresponding arms of the two supporting members being hinged to one another about a common hinge axis remote from and parallel to the cross struts, said movable supporting member being movable towards and away from the stationary supporting member between an open and a closed position, such that in the closed position the struts are generally parallel and in engagement, and in the open position they are generally parallel and spaced apart, the cross struts respectively connecting the upper ends of the arms of both the stationary and the movable supporting members, a third cross strut interconnecting the arms of the movable supporting member to provide a pedal for the movable supporting member, a foot member affixed to each of the arms of the stationary supporting member, a fourth cross strut interconnecting the foot members to provide a base, a substantially rectilinear elongate spring element fixed to the fourth cross strut and bearing against the third cross strut to provide a spring bias against movement of the movable supporting member towards its open position, each supporting member including at least one clamp adapted to clamp portion of the mouth of the pocket when that portion of the mouth has been folded over the cross strut of the supporting member, the arms of the movable supporting member each being elbow shaped and pivoted at one end with the stationary supporting member, the third

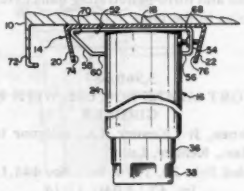
cross strut being fixed to the arms of the movable member near the apexes of the elbows.

3,960,352

LEG ASSEMBLIES FOR CABINETS

Robert F. Plattner, Spring Lake; Raymond J. Arend, and John A. Verberkmoes, both of Grand Haven, all of Mich., assignors to Bastian-Blessing, Grand Haven, Mich.

Filed June 10, 1974, Ser. No. 477,618
Int. Cl.² F16M 13/00
U.S. Cl. 248—188 4 Claims



1. A leg support assembly for cabinets and the like comprising:

an elongated channel member secured on the underside of said cabinet;

said channel member having a planar top wall and inwardly inclined depending edge flanges therealong defining camming surfaces along a downwardly facing channel opening that is narrower than said top wall;

said edge flanges of said channel member defining opposing camming surfaces and opposing inside oblique acute angle corners along the junctures of the edge flanges with said top inside wall;

a leg assembly having a tubular leg member with a planar top end plate affixed thereto;

said top end plate being wider than said tubular leg member and defining an opposite pair of edges of a greater width between them than the opening between the edge flanges of said channel member;

one of said edges of said top end plate being disposed within said channel opening engaging in the inside acute angle corner defined by one of said edge flanges within said channel opening;

the other of said edges of said top end plate having a depending flange therealong

positioned in laterally spaced relationship from the other inside acute angle corner with said leg assembly having an overall width of less than the distance between one inside acute angle corner and the edge of said opening remote therefrom and further positioned with said top end plate flush against the top inside wall of said channel member; and

adjustable locking means disposed at an acute angle to the camming surface of the other edge flange adjusted towards said other acute angle corner to lock said leg assembly within said channel opening.

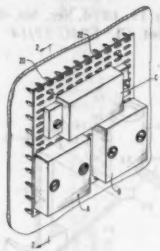
3,960,353

ELECTRICAL COMPONENT MOUNTING PANEL

Roy B. Leutwyler, Miami, Fla., assignor to Automated Building Components, Inc., Miami, Fla.

Filed Feb. 10, 1975, Ser. No. 548,730
Int. Cl.² A47F 5/00
U.S. Cl. 248—309 R 4 Claims

1. An assemblage comprising an electrical component mounting panel of sheet metal having a plurality of teeth struck therefrom to extend in a generally normal direction to one side of the plate and leaving a plurality of slots in said plate from which said teeth are struck, an electrical component, and means for securing said electrical component to said plate including a screw engaging said component and threadedly received in one of the slots in said plate, a backing panel,



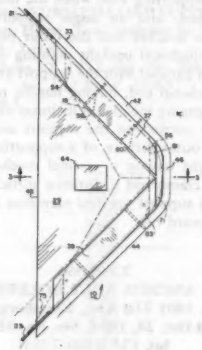
said plate being disposed against said backing panel with the tips of said teeth bearing against said backing panel, and means for securing said plate to said backing panel including screws threadedly engageable in said slots.

3,960,354

CORNER PROTECTOR

Wayne L. Simikoski, 3504 S. Mozart, Chicago, Ill. 60632

Filed Jan. 6, 1975, Ser. No. 538,620
Int. Cl.² A47B 95/00
U.S. Cl. 248—345.1 7 Claims



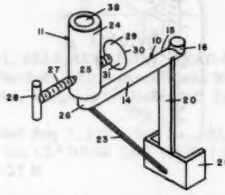
1. A corner protector adapted to extend over a corner portion of an object having upper and vertical surfaces, comprising: an upper plate composed of impact-absorbing material and a depending skirt portion composed of impact-absorbing material for overlying respectively the upper and vertical surfaces of the corner portion of the object for protection purposes, said skirt portion having a pair of side walls and having a smoothly contoured front wall joining said pair of side walls, said side walls having inner portions adapted to engage said vertical surfaces, said skirt portion having an inner front wall portion joining the side wall inner portions, said inner front wall portion being disposed substantially rearwardly of an imaginary intersection of the planes of said side walls to accommodate said corner portion, means for attaching releasably said plate and said skirt to the object to be protected, and a pair of elongated blocks fixed to the plate and extending along and engaging the inner portions of the side walls to serve as spacers for accommodating other differently-shaped corner portions.

3,960,355

SCAFFOLD SUPPORTING WALER BRACKET

Harry A. Prichard, Jr., deceased, late of King County, Wash., and by Amelia A. Prichard, 29621 - 20th Ave., South, Federal Way, Wash.

Filed July 11, 1974, Ser. No. 487,675
Int. Cl.[2] E04G *17/14*
U.S. Cl. 249—189 3 Claims



1. In a form structure for concrete having a plurality of spaced, aligned vertical prismoidal metal studs, each with holes spaced along its vertical medial centerline, ascaffold supporting waler bracket configured to be releasably supported by a metal stud, comprising, in combination:

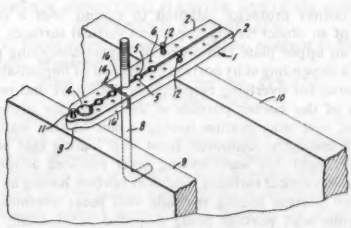
an elongate U-shaped support arm having a shorter perpendicularly projecting fastening arm at the inner stud end and a longer perpendicularly projecting cylindrical upright at the outer end with a bracket arm structurally depending from the support arm at a spaced distance from the shorter fastening arm, the bracket arm having a U-shaped bracket in its lowermost portion to fit about the body of a supporting stud when the fastening arm is fastened thereon, and an angle support communicating between the bracket and the outer part of the support arm, the cylindrical upright defining a medial threaded hole aligned parallel with the support arm and threadedly carrying a clamp rod, having handle means at its outer end and engaging means on its inner end to engage scaffold boards carried on the support arm to fasten them against the outer surface of a supporting stud, the cylindrical upright having a vertical medial hole extending above said clamp rod a distance sufficient to releasably receive and support vertical elements adapted to aid in forming a guard rail.

3,960,356

ANCHOR BOLT HOLDER

John H. Adams, 1801 21st Ave., Kingsburg, Calif. 93631

Filed Oct. 24, 1974, Ser. No. 517,586
Int. Cl.[2] B28B *23/00*
U.S. Cl. 249—205 3 Claims



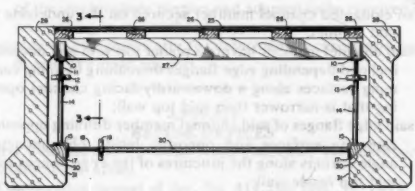
1. A holder for a structural element to be partially embedded in a fixed position in concrete during pouring of concrete in a pre-erected form comprising at least spaced-apart form boards; the holder comprising a generally fork-shaped body having a pair of elongated side-by-side legs dimensioned so as to span a space between spaced-apart form boards and adapted for the reception of a structural element therebetween, means connecting the legs at one end for movement of the legs toward each other whereby to clampingly engage and support a structural element therebetween, and means including at least a pre-formed hole in each of said legs for removably securing the legs of the body in fixed spanning relation to at least spaced-apart form boards with the legs maintained in clamping engagement with a structural element to be embedded whereby said securing means maintains said holder normally fixed against significant movement relative to at least spaced-apart form boards; said connecting means being a head integral with the legs; and said securing means comprising a form-penetrating nail extending through a pre-formed hole in the head and form-penetrating nails extending through pre-formed holes in the legs.

3,960,357

FORM SUPPORT MEANS FOR USE WITH PERFORMED GIRDERS

William S. Honea, Jr., Kenner, La., assignor to T. L. James Company, Inc., Kenner, La.

Filed Feb. 20, 1974, Ser. No. 444,142
Int. Cl.[2] E04G *17/18*
U.S. Cl. 249—211 7 Claims



1. A deck form supporting system component for use with a deck forming system including horizontally disposed forming members and floor forms placed above the forming members located between two supporting girders, each of the girders having a lower portion which has a horizontal component to it by being either slanted or horizontally disposed, said component comprising:

two opposed, vertical support assemblies including vertical length means for varying their length to a distance of the order of the distance from the top of one of such supporting girders to its lower portion;

a horizontal support assembly disposed between and in juxtaposition to said opposed vertical support assemblies including horizontal length means for varying its length to a distance of the order of the separation distance between the lower portions of such supportng girders;

two "L" shaped bracket means, one each interconnected between the bottoms of each of said vertical support assemblies and the adjacent end of said horizontal support assembly, for connecting them together at right angles;

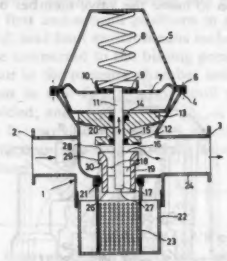
dual wedge means placed at the apex of said "L" shaped bracket means for supporting and positioning said "L" shaped bracket means on such horizontal component of such lower portion of such two supporting girders; and

bracing means for supporting at opposite ends thereof one of such horizontally disposed forming members, said bracing means being connected to the top of each of said vertical support assemblies, whereby the deck forming system can be supported between the supporting girders by being supported on their lower portions by said bracing means through said vertical support assemblies, said bracket means and said wedge means, which are held apart by said horizontal support assembly.

3,960,358
PRESSURE REDUCER

Rudolf Vollmer, 23 Friedrich Holderlinstrasse, and Bernhard W. Braukmann, 1 Am Rosenberg, both of Mosbach 695, Germany

Filed Feb. 11, 1975, Ser. No. 548,909
Int. Cl.² F16K 31/145
U.S. Cl. 251—61.5 7 Claims



1. A pressure reducer for fluid flow consisting of a housing having an inlet and an outlet, said housing having an internal valve disc, a biased resilient diaphragm exterior of said valve disc, a movable valve stem extending into said housing through said valve disc in sealed relationship thereto, one end of said valve stem being secured to said diaphragm opposed to the bias, the other end being located in said inlet, a movable tubular member having one end engageable with said valve disc, the other end of said tubular member extending into said inlet in sealing engagement thereto, said other end of said tubular member being secured to said other end of said valve stem, the surface of said one end of said tubular member which is subjected to fluid pressure being equivalent to the combined surfaces of said other end of said tubular member and connected valve stem which are subjected to the opposed fluid pressure caused by flow into said inlet.

3,960,359
STRETCHING SCREW

Bo Knut Lennart Svahn, Partille, and Lars Gustav Vilhelm Wersen, Goteborg, both of Sweden, assignors to J. Mustad AB, Sweden

Filed Feb. 1, 1974, Ser. No. 438,764
Claims priority, application Sweden, July 11, 1973, 7309714
Int. Cl.² B66F 3/08; F16B 7/06; F16G 11/12
U.S. Cl. 254—67 1 Claim

1. A turnbuckle comprising a first attachment section which comprises a tube having a non-round cross-sectional configuration;

a second attachment section;

a threaded element disposed to enable displacing said sections relative to said element and thereby relative to one another, said threaded element being rotationally mounted in said first attachment section and having a threaded aperture passing through said threaded element, said second attachment section having a threaded portion engaged in said threaded aperture;

stop means on said second attachment section for preventing turning movement of said second attachment section relative to said first attachment section upon displacement of said first and said second attachment sections relative to one another, said stop means having a length essentially agreeing with a maximum internal width dimension of said tube; and

a U-shaped loop on an end of said tube, said loop having legs and having apertures across the legs of said loop;

a bolt passing through said apertures and having a free, generally cylindrical end portion with a flat recess thereon;

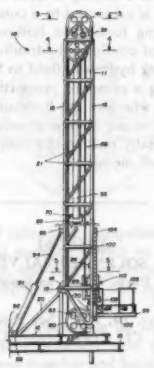
a non-round locking disc, and

a screw securing said locking disc to said U-shaped loop adjacent said bolt, said locking disc engaging said recess on said bolt, said locking disc being turnable around said screw and displaceable from its engagement with said recess upon loosening of said screw.

3,960,360
INTERNALLY PRESSURIZED LOAD SUPPORTING MAST

Thomas L. Elliston, Hurst, Tex., assignor to Thomas L. Elliston, Fort Worth, Tex.

Filed June 27, 1972, Ser. No. 266,630
Int. Cl.² B66C 23/60
U.S. Cl. 254—139.1 58 Claims



21. A workover rig comprising:

a mast structure having at least a pair of vertical leg members,

a cross head supported on said leg members at a predetermined elevation,

first and second crown pulleys supported on the upper part of said mast structure,

first and second base pulleys supported on the lower part of said mast structure,

a traveling block adapted to lower or raise a load, said block being vertically reciprocable along said leg members,

a hydraulic actuator having a piston rod rigidly secured at the cross head and arranged such that the cylinder housing will be moved downwardly along the mast when pressurized to place the piston rod in compression,

a first pair of traveling pulleys rotatable about a first trunnion mounted on the cylinder housing adjacent the bearing end of the cylinder,

a second pair of traveling pulleys rotatable about a second trunnion oppositely aligned with said first trunnion,

a first cable system cooperating with said first base, crown, and pair of traveling pulleys in a double purchase arrangement and being secured to said traveling block,

a second cable system parallel to said first system cooperating with said second base, crown, and pair of traveling pulleys in a double purchase arrangement and being secured to said traveling block, whereby said actuator may be selectively pressurized to operate said hoist means and whereby part of the lift load imposed on the mast is opposed by the reaction load from said actuator at said cross head.

33. A hoist apparatus comprising:

a mast structure;

traveling sheave means movable along the mast structure;

crown sheave means mounted on the upper end of the mast structure;

cable means secured at one end to the upper end of the mast structure and passing first around the traveling sheave means and then around the crown sheave means;

lift means secured to the other end of the cable means; and

a linear actuator interconnecting the upper end of the mast structure and the traveling sheave means for applying a force between the upper end of the mast structure and the traveling sheave means for forcing the traveling sheave means downwardly to thereby raise the lift means.

48. A system for applying a variable force to an object comprising:

a support structure;

means associated with the support structure for applying the force to the object with a variable resulting force applied to the support structure;

the support structure having at least one hollow structural member which is subjected to a compressive load by the variable resulting force, the hollow structural member being capable of confining hydraulic fluid; and

means for applying hydraulic fluid to the hollow structural member having a pressure proportional to the variable resulting force whereby the hydraulic fluid will produce a tension force in the hollow structural member tending to at least partially reduce the compressive load on the hollow structural member.

3,960,361
SOLENOID VALVE

Ray A. York, Villa Park, Calif., assignor to Bertea Corporation, Irvine, Calif.

Filed Mar. 14, 1975, Ser. No. 558,441
Int. Cl.² F16K *11/02, 31/06*
U.S. Cl. 251—141 **13 Claims**

1. A valve comprising:

a valve body having a chamber therein;

first and second passages in said valve body leading to said chamber;

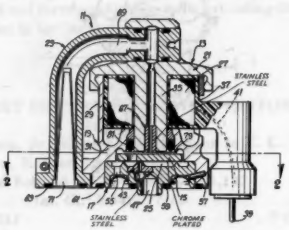
means defining a valve seat in said chamber, said first passage terminating in a first port substantially at said valve seat;

first means in said chamber substantially circumscribing said valve seat for protecting the valve seat;

a valve member having a first position in which it engages the valve seat to block flow through said first port, said valve member including magnetic material;

said first and second passages being adapted to lead to regions of first and second fluid pressures, respectively, with said second pressure being greater than said first pressure whereby a resultant differential fluid force can act on said valve member and tend to maintain said valve member in said first position;

electromagnetic means carried by said valve body and energizable to apply a resultant electromagnetic force to the valve member, said resultant electromagnetic force acting in a direction to move the valve member out of said first position;



means defining a first fulcrum in said chamber;

said valve member being pivotable on said first fulcrum out of said first position in a first stage pivoting movement whereby communication between said chamber and said passage through said first port is established;

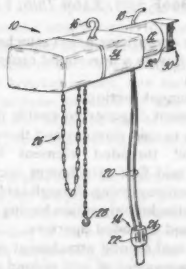
the resultant electromagnetic force being further from said first fulcrum than the resultant fluid force whereby said first stage pivoting movement is carried out with mechanical advantage; and

said valve member having a surface engageable with said valve seat, said surface being of nonmagnetic material and being harder than the magnetic material of said valve member.

3,960,362
HOIST CONTROL WITH LIMIT SWITCHES

Thomas C. Griffiths, Forrest City, and Albert L. Slack, Little Rock, both of Ark., assignors to Eaton Corporation, Cleveland, Ohio

Filed Oct. 8, 1974, Ser. No. 513,013
Int. Cl.² B66D *1/00*
U.S. Cl. 254—168 **7 Claims**



1. A limit switch actuated control valve assembly for supplying power to the air motor of an air motor driven hoist comprising:

a housing forming a main chamber communicating with an exhaust port for venting the main chamber, a supply inlet port for providing supply air to the main chamber, and an

outlet port for supplying supply air from the main chamber to the air motor;

piston means slidably mounted within the main chamber to seal the exhaust port and connect the supply inlet port to the outlet port in a first position and to seal the air supply port and connect the outlet port to the exhaust port in a second position;

a biasing pressure chamber formed in said housing on one side of said piston means

limit switch means for moving said piston means between said first and second positions in response to a control signal, said limit switch means including a normally open valve connected to the biasing pressure chamber to supply air to the pressure chamber and maintain said piston means in said first position until said control signal is provided; and

means for providing a control signal to said limit switch means upon the hoist reaching a predetermined hoisting position.

3,960,363

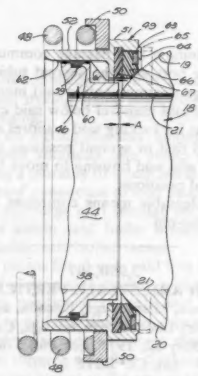
BALL VALVE

Frank F. Domyan, Studio City, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 372,203, June 21, 1973, abandoned. This application July 24, 1974, Ser. No. 491,404

Int. Cl.² F16K *25/00*

U.S. Cl. 251—174 **1 Claim**



1. Fluid control apparatus comprising: a valve body having first and second ends with first and second openings respectively, extending completely therethrough, said valve body having internal circumferential wall means substantially defining a chamber intermediate of said first and second valve body ends, said first valve body end having a reentrant hollow cylinder extending into said chamber, said cylinder having internal and external surfaces approximately concentric about a single first axis of symmetry, said cylinder having an O-ring groove in the external surface thereof substantially concentric with said first axis; a resilient O-ring trapped in said groove and immobile relative to said cylinder; a seal assembly having an approximately cylindrical internal surface approximately concentric with said first axis engaging and compressing said O-ring, said seal assembly internal surface having an inside diameter greater than that of said cylinder outside diameter to permit said seal assembly to rock and to swivel on said O-ring; a ball mounted on said wall means in a manner to rotate about a second axis substantially normal to said first axis, said ball having spherical surface portions around a cylindrical hole, extending completely therethrough defined by an internal surface alignable with and of approximately the same inside diameter as that of said cylinder internal surface, said alignment being made possible by the rotatability of said ball, said ball internal surface being concentric with said first axis during said alignment, said seal assembly including an annular seal extending around said hole at a diameter greater than that of said hole with said alignment occurs, said seal and said O-ring preventing fluid from entering said chamber by passing between said seal assembly and said O-ring or by passing between said seal assembly and said ball; and bias means mounted between said valve body and said seal assembly to hold said seal into fluid tight engagement with said ball, said cylinder external surface being spaced radially from said wall means in a radial direction from said first axis forming an annular pocket in which said seal assembly is located, said cylinder having an inner end terminating contiguous to said ball leaving a very small gap therebetween so as to minimize any leaks which might develop in the vicinity of said O-ring and said seal by providing a constriction between said ball and said cylinder, said first valve body end including said cylinder having a wall and being substantially rigid, fluid tight and effectively isotropic so as to prevent any fluid from entering said pocket through the wall of said valve body first end and said cylinder, said first and second openings being in communication with each other during said alignment, said ball being rotatable to a position cutting off all communication between said first and second openings.

3,960,364

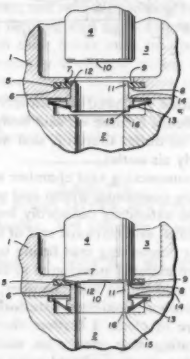
HIGH PRESSURE TIGHT SHUTOFF VALVE SEAL

Michael E. Hargrave, Union Grove Lake, Iowa, assignor to Fisher Controls Company, Marshalltown, Iowa

Filed Aug. 1, 1974, Ser. No. 494,012

Int. Cl.² F16K *25/00*

U.S. Cl. 251—210 **6 Claims**



1. A tight-shutoff valve seal, comprising:

a deformable seal member having an inner periphery, an outer periphery, and first and second generally annular faces, said second face having first and second concentric portions;

a first valve member including an annular groove and a cylindrical surface adjacent said groove, said groove receiving said seal member and having faces abutting one of said peripheries, said first face, and said first portion of said second face of said seal member, and said cylindrical surface being of substantially the same diameter as the other of said peripheries of said seal member;

a seal retaining member having a first surface slidable on said cylindrical surface of said first valve member and on the other of said peripheries of said seal member, and enclosing said other periphery and having a second surface perpendicular to said first surface;

a second valve member having an annular surface facing toward said second portion of said second face of said

seal member and said second surface of said retaining member;

resilient means for biasing said retaining member toward said second valve member; and

mechanical stop means on said retaining member for abutting a portion of said first valve member after said retaining member slides a predetermined distance on said first valve member to prevent excessive deformation and damage to said seal member,

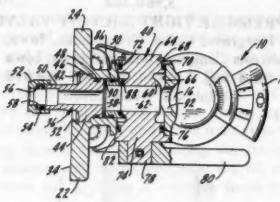
one of said first and second valve members being moveable toward the other of said valve members to a valve-closing position, wherein said second surface of said retaining member abuts said annular surface of said second valve member, said retaining member slides on said first valve member compressing said resilient means, and said second portion of said second face of said seal member sealingly engages said annular surface of said second valve member.

3,960,365

GLADHAND WITH SHUTOFF COCK

Charles Horowitz, Niles, Ill., assignor to Sloan Valve Company, Franklin Park, Ill.

Filed May 7, 1975, Ser. No. 575,467
Int. Cl.² F16K *51/00*
U.S. Cl. 251—286 **10 Claims**



1. In a combination gladhand and shutoff cock, a gladhand body, mounting means formed on said body, an air chamber in said body and an outlet therefor, seal means surrounding said gladhand body air outlet,

passage means connecting said chamber and said mounting means, a fitting positioned within said passage means and having an end extending outwardly from said body and mounting means, said outward end of said fitting including means for connecting said fitting to a conduit,

a rotatable valve member positioned in said passage means intermediate said fitting and chamber, and a handle for said valve member positioned exteriorly of said body.

9. The structure of claim 1 further characterized by and including cooperating stop means on said body and valve member for limiting rotation of said valve member.

3,960,366

REVERSE ACTING LOCK OPEN CROSSOVER VALVE

Dave L. Abney; Robert C. Williams, both of Dallas, Tex., and Horace E. Gilbert, Gretna, La., assignors to Dresser Industries, Inc., Dallas, Tex.

Division of Ser. No. 194,228, Nov. 1, 1971, Pat. No. 3,818,986.
This application Mar. 18, 1974, Ser. No. 452,233
Int. Cl.² E21B *43/04*
U.S. Cl. 251—341 **1 Claim**

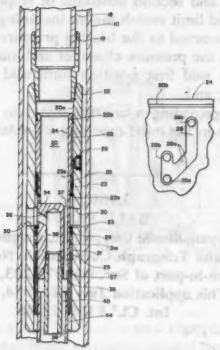
1. A crossover valve apparatus adapted for use in a well bore having a first tubing string and a second tubing string inside a portion of the first tubing string comprising:

a housing operably connectable to the first tubing string and having a pair of axially spaced apart seal bores and at least one lateral opening in the wall of said housing located intermediate said seal bores; and,

a mandrel operably connectable to the first tubing string, within said housing, said mandrel being movable axially between a first position and a second position relative to said housing and having a first seal engaging one of said seal bores in both of said positions,

a second seal spaced axially from said first seal and engaging one of said seal bores in said first position and engaging the other said seal bore in said second position,

at least one side port in the wall of said mandrel located between said first and second seals,



a crossover defining a first passage communicating said at least one side port and the second tubing string and a second passage communicating said mandrel above said crossover and said mandrel below said crossover, and

releasable means for locking said mandrel and said housing in one of said first or second positions and for allowing said mandrel and said housing to move the other of said first or second positions,

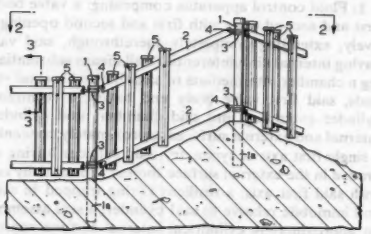
wherein said releasable means comprises a jay-slot and a cooperating jay-pin.

3,960,367

FENCE WITH ADJUSTABLE VERTICAL PANELS

Alan Francis Rogers, Mississauga, Canada, assignor to Spacemaker (Products) Limited, Mississauga, Canada

Filed May 12, 1975, Ser. No. 576,871
Int. Cl.² B21F *27/00*
U.S. Cl. 256—21 **10 Claims**



1. A fence comprising longitudinal rails defining continuous longitudinally extending channels, panels that can be erected vertically, parallel to one another and transversely to the rails, and clamps for affixing the panels to the rails, the clamps being slidably engageable in the channels of the rails for adjustment of positions of the panels therealong, the clamps being of narrower width than the panels so that if desired the panels can be arranged in edge to edge contact with one

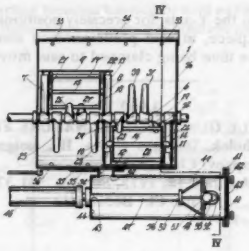
another, and releasable means for securing the clamps in fixed relationship with the panels and the rails.

3,960,368

HIGH VISCOUS DYEING SIZING MATERIAL PRODUCING MACHINE

Tozo Kishimoto, 5, Nishinokyo, Hinokuchi-cho, Nakagyo, Kyoto, Japan

Filed Nov. 8, 1974, Ser. No. 522,270
Int. Cl.² B01F 7/04, 15/02
U.S. Cl. 259—10 5 Claims



1. An apparatus connnected to a steam source for producing highly viscous dyeing sizing from starch solutions, said apparatus comprising:

boiling means for mixing together, heating, and steam boiling said starch solutions into sizing paste, said boiler means having a plurality of steam inlets through the lower portion thereof connected to said steam source and also have a first discharge port through the bottom thereof;

stirring means within said boiler means for stirring said starch solution inside said boiler means;

slidable cover means fitted over said first discharge port for opening and closing said discharge port;

cylinder means positioned beneath and connected at the rear thereof to said first discharge means for receiving the steam boiled sizing paste mixture discharged from the boiler means through said first discharge port;

straining screening means in the end of said cylinder means opposite the end connected to said first discharge port for straining therethrough the sizing paste contained in said cylinder means, whereby the mixture is strained to a uniform consistency;

hydraulic piston means reciprocally movable within said cylinder means for forcing said sizing paste in said cylinder means through said screening means, said piston means further having a second discharge port therethrough; and

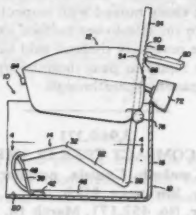
valve means positioned over said second discharge port for controlling the flow of sizing paste through said second discharge port in said piston means in relation to the direction of movement of the piston means, whereby movement of the piston means toward said screening means causes said valve means to close, thereby forcing all of the sizing mixture between said piston means and said screening means outward through said screening means, and whereby withdrawing said piston means from the screening means causes said valve means to open and causes the sizing paste drawn into the cylinder means through said first discharge port during the forcing of the sizing mixture through said screening means to flow from one side of said piston means to the other side of said piston means through said second discharge port.

3,960,369

STIRRING MECHANISM

Warren T. Sommer, 17130 Sunset, Detroit, Mich. 48212

Filed June 20, 1974, Ser. No. 481,028
Int. Cl.² B01F 7/20; A47J 43/04, 43/07
U.S. Cl. 259—111 13 Claims



9. A mechanical stirring device for mixing fluids in a container having a bottom surface and a side wall terminating in a rim, including a drive unit having a rotary drive member engaging the rim of the container to impart motion to the stirring device within the container, wherein the improvement comprises:

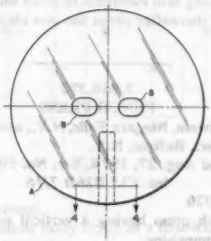
a stirrer releasably attachable to the drive unit and projecting downwardly from the drive unit into the container for mixing fluids, said stirrer including a pair of spaced, parallel uprights releasably attached to the drive unit and a mixing frame extending generally radially from a bottom portion of the uprights toward the center of the container, said mixing frame being spaced from the bottom surface of the container, and said stirrer being formed of a unitary rod, said rod forming said pair of uprights, said uprights terminating at their lower ends in elbows and said rod forming a generally U-shaped mixing section interconnecting said two elbows and defining said mixing frame, said U-shaped section having different vertical elevations with respect to the container bottom surface to provide mixing at different vertical levels within fluids.

3,960,370

ELECTRIC FOOD MIXER SPATTER GUARD

Adele Lorraine Bewley, 399 Getzville Road, Amherst, N.Y. 14226

Filed Nov. 13, 1974, Ser. No. 507,579
Int. Cl.² B01F 7/16
U.S. Cl. 259—118 1 Claim



1. A spatter guard in combination with a portable electric food mixer comprising;

a. a portable electric food mixer having a pair of beaters connected thereto by a pair of beater shafts;

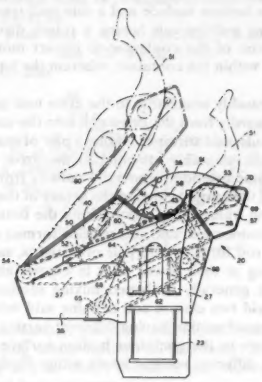
b. a mixing bowl, independent of and unconnected to said portable mixer, having a rim,

c. a generally circular thin disc having an upper and a lower surface, said lower surface resting on said rim,
d. a pair of openings between said upper and lower surfaces with said shafts passing therethrough,
e. each of said openings being defined by a pair of opposed circular edges connected by substantially linear edges to provide clearances for said beater shafts whereby the same can be easily moved with respect to said disc, and
f. a radial sieve on said lower surface extending from the center to the periphery thereof, said sieve being so sized as to permit liquid to pass therethrough but to prevent solids from passing therethrough.

3,960,371
COMPACT TREE CLAMP

Ian McKenzie, Lambeth, Canada, assignor to Clark Equipment Company, Buchanan, Mich.

Division of Ser. No. 452,171, March 18, 1974, Pat. No. 3,924,667. This application Mar. 6, 1975, Ser. No. 556,062
Int. Cl.² A01G *23/08*; B23Q *1/04*
U.S. Cl. 269—55 **5 Claims**



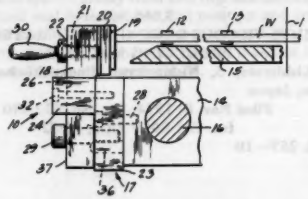
1. A clamp for elongated objects having a longitudinal axis of substantially greater length than the largest transverse dimension comprising a fixed jaw, a movable jaw closable on the fixed jaw, said movable jaw having separate pivotally mounted elements, one being pivoted on one side of the longitudinal axis of said object and the other being pivotally mounted on the opposite side and extending transversely below the object to pivotally connect the said one element, and means causing said elements to pivot on the said one side of the axis and thereafter pivot the one element on the other side.

3,960,372
PUNCH PRESS

James A. Mc Elwain, Niagara Falls, N.Y., assignor to Houdaille Industries, Inc., Buffalo, N.Y.

Filed Aug. 27, 1974, Ser. No. 500,874
Int. Cl.² B26D *7/16*
U.S. Cl. 269—320 **11 Claims**

1. In a punch press having a vertical punching axis, the combination comprising:
a. means adapted to be clamped to a workpiece for moving the workpiece in the X and Y axes in a horizontal plane intersecting the punching axis;
b. a side gage member carried on said moving means and movable between an upper extended position intersecting said horizontal plane and a retracted position below said plane, said side gage member having a gaging surface which, in at least said extended position, is horizontally spaced by a predetermined distance in the X-axis from a vertical plane, extending through the punching axis and

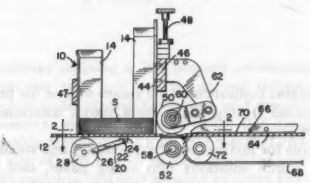


parallel to the Y-axis, for precisely positioning an edge of the workpiece, at said predetermined distance for the workpiece then being clamped to said moving means.

3,960,373
SHUTTLE GUARD FOR SIGNATURE FEEDER

Jaroslaw Pacholok, Downers Grove, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed Jan. 15, 1975, Ser. No. 541,375
Int. Cl.² B65H *3/12*
U.S. Cl. 271—10 **7 Claims**



1. A signature feeding apparatus comprising means forming a magazine for holding a stack of signature pieces, a shuttle plate mounted for reciprocation in the bottom of said magazine forming means and constituting the floor of said magazine, said shuttle plate having means for gripping the lowermost signature in the stack so as to advance the signatures one-by-one to a transport system, means forming a gate at the bottom of said magazine for passage of successive signatures, a signature transport system having a signature receiving end adjacent said gate and having means for advancing successive signatures through said gate, said transport system having floor forming means with the signature receiving end thereof spaced relative to the path traversed by the leading end of said shuttle plate so as to leave a gap when the shuttle plate retracts with portions thereof exposed, and means bridging said exposed portions of said gap so as to prevent any foreign object from lodging in said gap and minimizing the risk of damage to the machine or the object by movement of the shuttle plate.

3,960,374
SHEET DELIVERY SYSTEM

John Marshall Gaffney, Cleveland, Ohio, assignor to Harris-Intertype Corporation, Cleveland, Ohio

Filed June 15, 1972, Ser. No. 262,982
Int. Cl.² B65H *29/04*, *29/34*, *31/03*
U.S. Cl. 271—189 **6 Claims**

1. A continuous sheet delivery for racking individual small sheet piles on a pile platform wherein the piles are built from the bottom up by delivering sheets to a skid on said platform to form a pile of sheets on the skid, placing a relatively stiff board above the pile, supporting the board from the skid outside the edges of the pile thereon and building subsequent small piles in the same fashion with additional boards serving

to support the small piles independently of one another, said delivery comprising:

a pair of side frames,

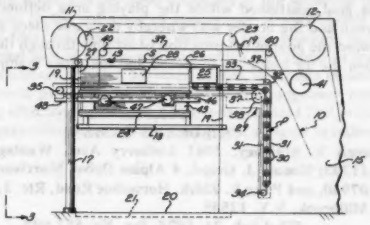
a delivery conveyor mounted in said side frames for delivering sheets individually in a horizontal direction,

a main hoist for supporting said skid for vertical movement between a sheet-receiving position immediately below said conveyor and a lower pile-unloading position,

an auxiliary hoist having frame means at the outer sides of said piles,

means for raising and lowering said frame means between an upper sheet-receiving position immediately below said conveyor and a lower limit sufficiently below said upper position to allow for build-up of sheets on said auxiliary hoist while a full pile is being removed from said platform,

a pile supporting member carried by said auxiliary hoist and movable between an inoperative position clear of the pile



at one side thereof to an operative, horizontal sheet-intercepting position,

board-supporting members carried by the frame means of the auxiliary hoist at the sides of the pile, said board-supporting members comprising horizontal ledges on which boards may be slid below said pile supporting member when the latter is in its operative position, the relationship of said ledges and pile supporting member being such that the top of a board on said ledges is out of contact with but is closely adjacent the bottom of said pile supporting member,

and means for moving said ledges toward each other to an operative position in which the ledges receive and support the sides of a board and away from each other to an inoperative position spaced beyond the edges of a board, whereby said board and a small pile of sheets received from said pile supporting member may be transferred to said main hoist and lowered past said ledges.

3,960,375

ELEMENT FOR USE IN MAKING A PLAYING SURFACE

Albert Bibi-Roubi, and Robert Bibi-Roubi, both of 24 rue de l'Ourcq, 77 Fresnes-sur-Marne, France

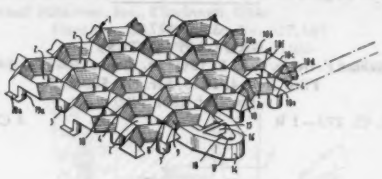
Filed Apr. 14, 1975, Ser. No. 567,888

Claims priority, application France, Apr. 18, 1974, 74.13560

Int. Cl.[2] A63B *61/00, 71/02*

U.S. Cl. 272—3 **11 Claims**

2. An element for use in making a playing surface, said element comprising an upper face which forms the general plane of the facing and a plurality of side faces; coupling means on each of said side faces, said coupling means comprising male parts and female parts arranged with a male part on some of said side faces and a female part on the others of said side faces whereby a plurality of adjacent elements can be coupled together by connection of adjacent male and female parts; each male part comprising a downwardly extending hook having a shank and a curved part projecting laterally therefrom; each female part comprising a loop projecting laterally from the respective side face and defining an opening the axis of which is perpendicular to the plane of the facing, wherein the loop has an elastic membrane located adjacent to the side face and substantially perpendicular to the plane of



the facing, said curved part of the hook being adapted to elastically deform the membrane during entry and engage below said membrane when adjacent elements are coupled.

3,960,376

BALANCING SKILL GAME

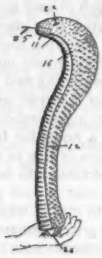
Evan H. Berlin, 119 Dunn Ave., Lake City, Pa. 16423

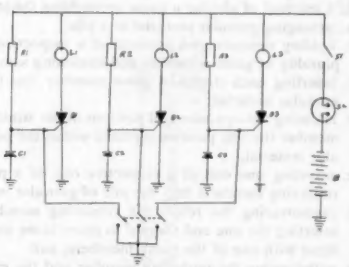
Continuation-in-part of Ser. No. 274,707, July 24, 1972, Pat. No. 3,784,196. This application Aug. 31, 1973, Ser. No. 393,312

The portion of the term of this patent subsequent to Jan. 8, 1991, has been disclaimed.

Int. Cl.[2] A61B *5/16;* **A63F** *9/06*

U.S. Cl. 273—1 E **8 Claims**





1. A toy comprising,

an elongated hollow body made in a first half and a second half and fixed together,

an electrical circuit contained by said body,

said circuit comprising a plurality of lamps, a source of electrical energy in series with each of said lamps, time delay means in circuit with said source of electrical energy and said lamps for causing said lamps to become illuminated sequentially and inclination sensitive means in series circuit between said source of electrical energy and said lamps for controlling current through said cir-

cuit, and breaking said circuit when said body is inclined beyond a certain angle.

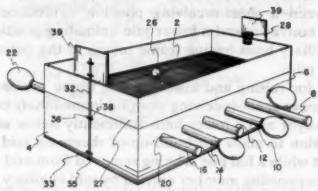
3,960,377
GAME APPARATUS
Natividad F. Doyle, 6202 E. 150th St., Grandview, Mo. 64030
Filed June 4, 1975, Ser. No. 583,625
Int. Cl.² A63F 9/00
U.S. Cl. 273—1 R 4 Claims

1. A game device comprising in combination:
a. a quantity in depth of granular material:
b. a plurality of game members each having an elongated resilient intermediate portion extending between and connected to enlarged opposite end portions which are held by a player during stretching thereof to an extended condition and held in the extended condition during insertion thereof into said granular material, said game members each moving within said granular material upon release of at least one of the opposite end portions thereof to reposition same in said granular material, said intermediate portion of each of said game members being twistable in either direction by a player prior to being inserted into said granular material, said intermediate portion of each of said game members untwisting upon release to further aid in repositioning said respective game member within said granular material; and
c. at least one retrieving member having one end thereof formed to define a hook for for receiving therein said intermediate portion of one of said game members, said one end being insertable into said granular material by a player to remove one of said game members upon engagement therewith during withdrawal of said retrieving member from said granular material whereby players may position said game members in said granular material and insert a respective one of said retrieving members into said granular material in an attempt to remove one of said game members upon withdrawal of said respective retrieving member, said hook being substantially U-shaped.

2. A method of playing a game comprising the steps of:
a.. arranging granular material in a pile;
b. holding opposite end portions of a respective one of a plurality of game members and stretching same;
c. inserting each stretched game member into the pile of granular material;
d. releasing the opposite end portions of the stretched game member thereby positioning same within the pile of granular material;
e. inserting one end of a respective one of a plurality of retrieving members into the pile of granular material;
f. maneuvering the respective retrieving member during inserting the one end thereof to move same into engagement with one of the game members; and
g. withdrawing the retrieving member and the game member therewith.

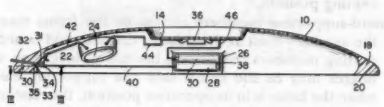
3,960,378
TARGET AND AIR ACTUATED PROJECTORS
William J. Bahr, 4101 Sandpiper Lane, Great Bend, Kans. 67530
Filed Mar. 12, 1975, Ser. No. 557,794
Int. Cl.² A63F 7/06
U.S. Cl. 273—85 H 4 Claims

1. An airball game comprising: a game piece; a base; a mesh screen removeably mounted on said base allowing passage of air through its mesh, a border wall removeably mounted around said screen; a plurality of playing tubes retractably and rotatably mounted in the base to underlie the screen and extending the entire transverse length of the base; said tubes having an air bulb on one end and a cap at the second end; a



nozzle spaced intermediate the ends of the tubes; and at least one goal positioned within the playing area defined by the screen and the border wall whereby the game piece is moved toward the goal in the direction of air flow through the nozzle when the air bulbs are squeezed and the tubes manipulated.

3,960,379
CHILDREN'S GAME
Joseph V. Maloney, 3381 Lufberry Ave., Wantagh, N.Y. 11793; Ronald J. Geigel, 4 Alpine Drive, Morristown, N.J. 07960, and Peter R. Zidek, Horseshoe Road, Rte. 2, Box 87, Millbrook, N.Y. 12545
Filed Feb. 24, 1975, Ser. No. 552,693
Int. Cl.² A63B 71/00; G08B 21/00
U.S. Cl. 273—95 R 6 Claims



1. A game comprising, in combination:
a base; and
a kickable object;
said base comprising:
ground-gripping means;
an enclosure having a depression for receiving said kickable object on its upper surface;
said base containing interior thereof battery means, first and second switch means, audible signal producing means and circuitry means capable of connecting said signal means across said battery means for the generation of an audible signal upon closure of both said first and second switch means;
said first switch means being manually closeable; and
magnet means positioned within said kickable object so as to be adjacent said depression, said second switch means being adjacent said depression and magnetically held in the open position by said magnet means when said object is placed in said depression.

3,960,380
LIGHT RAY GUN AND TARGET CHANGING PROJECTORS
Gunpei Yokoi, Kyoto, Japan, assignor to Nintendo Co., Ltd., Kyoto, Japan
Filed Jan. 27, 1975, Ser. No. 544,342
Claims priority, application Japan, Sept. 16, 1974, 49-106237; Dec. 1, 1974, 49-138658; Dec. 31, 1974, 50-1752
Int. Cl.² A63F 9/02
U.S. Cl. 273—101.1 5 Claims

1. In a rapid firing game machine including a shooting system having a screen means, a weapon and a shooting detection means having a target area on said screen, a first motion

picture projector for projecting an image showing an object to be shot at onto said screen, and a second picture projector for projecting an image showing said object in a defeated condition upon successful firing of said weapon at said object, the improvement comprising, in combination, employing a light-emitting gun as said weapon and at least one photo-sensor element which emits a signal when struck by light as said shooting detection means, the area on the screen, which when struck by light from said weapon will activate said photo-sensor, being the target area at least including a life-size image of each object to be shot as projected onto said screen, a single first film mounted on said projector having a plurality of scenes including at least a corresponding number of objects to be shot at, the first portion of each of said scenes showing the object in the scene to be shot at in a challenging position and a next portion thereof showing the same object in a triumphant position, a single second film mounted on said second projector having the same number of scenes showing the respective objects in defeated condition in the sequence corresponding to the sequence of appearance of said objects on said first film, said second film having a view-blocking image in an initial part of each scene and having a changeover mark at the boundary between adjacent scenes, detecting means in said second projector for detecting said changeover mark, shooting effective signal generating means in said first projector for generating from said first projector a signal to indicate

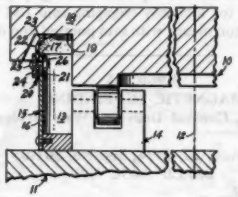
when a portion of the scene corresponding to a time during which shooting will be effective for each of the scenes is displayed by said first film on said first projector, projector driving means coupled to said projectors for driving said first projector throughout the operation of the machine and for driving said second projector, control circuit means having inputs coupled to said shooting effective signal generating means, said sensor element, and said detecting means and having outputs coupled to said projector driving means for driving said second projector in the intervals in which a signal is received from said photo-sensor element and a shooting effective signal is received at the same time from said shooting effective signal generating means or when said shooting effective signal has disappeared without generation of a signal from said photo-sensor element, and for stopping said second projector when a changeover mark on said second film has been detected by said detecting means, and means coupled to said control circuit means for effectively directing the light projected from the second projector onto the screen only when a signal is received from said photo-sensor element and a shooting effective signal is simultaneously received from said shooting effective signal generating means and for continuing to direct the light from the second motion picture projector onto the screen until a changeover mark is detected, and for effectively directing the light from the first motion picture projector onto the screen when light from the second motion picture projector is not directed onto the screen.

3,960,381

SEAL METHOD AND APPARATUS

Tadeusz Wiktor Piotrowski, Cincinnati, Ohio, assignor to Cincinnati Milacron, Inc., Cincinnati, Ohio

Filed Oct. 30, 1975, Ser. No. 627,147
Int. Cl.² F16J *15/34;* B23P *11/00*
U.S. Cl. 277—1 **4 Claims**



1. An environmental seal assembly, comprising in combination:

a. a base member, having a chamber formed therein which is bounded by a continuous peripheral exterior surface on said base member;

b. a plate, rotatably carried with respect to said base member, having a seal surface in the plane of rotation disposed towards said base member so as to provide a surface for enclosing said chamber; and

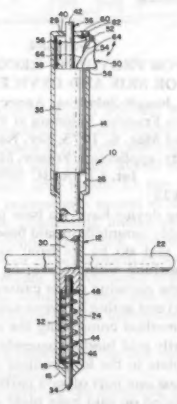
c. an elastomeric band, having a continuous band length which, when relaxed, is of lesser dimension than said peripheral surface, and further having a band width comprising a first portion and a second portion, wherein said first portion is stressed and fitted over said peripheral surface, and said second portion is free of restraint, said second portion tending to curl and form a stable smooth annular bight, and further wherein said plate seal surface is in contact with said bight, thereby forming a sealed chamber bounded by said base member, said band, and said plate.

3,960,382

SKI POLE WITH RETRACTABLE POINT

Tom Reynolds, Islip, N.Y., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Sept. 8, 1975, Ser. No. 611,560
Int. Cl.² A63C *11/22*
U.S. Cl. 280—11.37 P **4 Claims**



1. A ski pole comprising an elongated tubular shaft having a cylindrical hand grip portion at one end, a rod means slide-

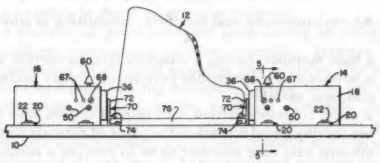
ably mounted in said shaft, said rod means having a generally pointed end adapted to be deployed from the opposite end of said tubular shaft, spring means within said shaft for urging said rod means to a position with said pointed end retracted inside said tubular shaft, actuating button means projecting from said rod means axially through said hand grip portion for deploying said pointed end upon depression of said button means, and means carried by said hand grip portion, and movable radially, for lockably engaging said rod when positioned by said button means with said pointed end deployed.

3,960,383

MAGNETIC SKI BINDING

Bryan L. O'Neil, General Delivery, West Bridgewater, Vt. 05034

Filed Aug. 28, 1974, Ser. No. 501,057
Int. Cl.² A63C 9/08
U.S. Cl. 280—612 **7 Claims**



1. A ski binding unit for binding a ski to a ski boot that is equipped with magnetically conductive means, said unit comprising:

a housing having first and second ends and means for attaching said housing to said ski so that said first and second ends are aligned lengthwise of said ski;

two magnetically conductive pole pieces disposed within and mounted to said housing so that an end surface of each pole piece projects out of said first end of said housing for engagement by said ski boot;

a permanent magnet disposed within said housing between and proximate to said pole pieces so as to induce a magnetic field in said pole pieces for magnetically binding said magnetically conductive means to said pole piece end surfaces;

said magnet being movable relative to said housing and said pole pieces so as to permit adjustment of the intensity of the magnetic field at said pole piece end surfaces; and

means for moving said magnet relative to said housing and said pole pieces.

3,960,384

METHOD FOR PROVIDING RECOIL IN A SAFETY BINDING FOR SKIS AND DEVICE FOR THE SAME

Georges Pierre Joseph Salomon, Annecy, France, assignor to Etablissements Francois Salomon et Fils, Annecy, France

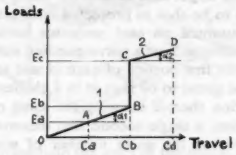
Filed Mar. 6, 1975, Ser. No. 555,865
Claims priority, application France, Mar. 8, 1974, 74.07967
Int. Cl.² A63C 9/08
U.S. Cl. 280—623 **15 Claims**

1. In a binding device having a base plate fixed to a ski and a binding assembly mounted on said base plate for maintaining a boot against said ski by its front and rear extremities, a method for absorbing without altering the characteristics of safety release, the parasitic stress caused, for example, by the flexion of the ski and acting between said boot and the binding assembly, said method comprising the steps of

providing partly said binding assembly slidably movable on said base plate in the longitudinal direction of the ski,

keeping at least one part of said partly slidably binding free to be displaced on said base plate against the action of a first resilient means for a first resilient displacement of said one part corresponding to a first series of load values, said first resilient means being interposed between said one part movable during said first resilient displacement and a stop part which is at least temporarily immobilized relative to said base plate during said first resilient displacement,

temporarily immobilizing relative to said base plate said at least one part by means of the stop part for a second series of load values higher than the first series



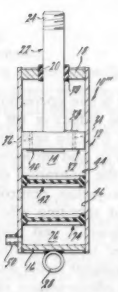
and keeping at least one part of said partly slidably binding free to be displaced on said base plate against the action of a second resilient means for a second resilient displacement of said one part corresponding to a third series of load values, said second resilient means being interposed between said one part of the binding movable during said second resilient displacement and a stop part which is immobilized relative to said base plate during said second resilient displacement.

3,960,385

LEVELING SYSTEM

Johan H. Keijzer, Hasselt; Willy R. J. Pierie, Tienen, and G. Van de Voorde, Sint-Martent-Latem, all of Belgium, assignors to Monroe Belgium N.V., Sint-Truiden, Belgium

Division of Ser. No. 261,608, June 12, 1972, Pat. No. 3,847,410. This application Oct. 24, 1974, Ser. No. 517,606
Int. Cl.² B60G 11/26
U.S. Cl. 280—692 **32 Claims**



1. In a leveling system for a vehicle having sprung and unsprung portions,

at least one level strut comprising a cylinder connected at one end to one of the vehicle portions,

a piston reciprocally mounted within said cylinder,

a piston rod connected to said piston and projecting from one end of said cylinder and adapted for connection to the other of the vehicle portions,

a quantity of damping fluid within said cylinder for damping reciprocal movement of said piston,

means defining a gas chamber containing a quantity of a compressible gas,

first separating means for separating said gas from said damping fluid,

means for varying the pressure of said gas to control the relative attitude between the sprung and unsprung vehicle portions, and

second separating means separating said quantity of gas from said last mentioned means.

3,960,386

MEANS FOR EXPANDABLE OBJECTS, PREFERABLY SHOCK-ABSORBING PROTECTIVE MEANS FOR PASSENGERS IN VEHICLES

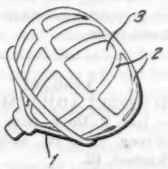
Hans Ivar Wallsten, Saffle, Sweden, assignor to AB Inventing, Saffle, Sweden

Filed July 20, 1973, Ser. No. 381,145

Claims priority, application Sweden, Feb. 12, 1973, 7301928

Int. Cl.² B60R *21/08*

U.S. Cl. 280—731 **8 Claims**



1. Expandable means adapted for use as shock-absorbing protective means and the like for passengers in vehicles, said means comprising: a normally folded compact enclosure adapted to be expanded to a predetermined three-dimensional configuration from its folded state and having a similarly folded and expandable system of branched gas receiving channels interconnected and communicating with each other and extending along the walls of the enclosure, in which the enclosure is expanded by supplying compressed gas to said channels so that the ambient air at least partially fills the hollow interior of the expanded enclosure, said channels comprising an inflatable inner space whose inflation is limited by a thin, flexible, elastic and substantially gastight inner wall, said inner wall comprising a pair of branched continuous flat strips of material arranged one upon the other and joined along their long sides, said inner wall being surrounded by a flexible outer wall arranged, when the inner space is inflated, to entirely surround the inner wall and limit its expansion, and which becomes relatively stiff and assumes a substantially circular cross section upon expansion, said outer wall being a material which is strong enough to withstand the pressure prevailing in the inner space; said outer wall comprising two strips of material arranged one upon the other and joined along their long sides, joining means between the strips of material being sufficiently strong to withstand the pressure prevailing in the inner space and thereby limit the expansion of the inner wall.

3,960,387

MANUALLY PROPELLED TOY SNOW VEHICLE

Arnif G. Nerio, 2223 Cumberland St., Saginaw, Mich. 48601

Filed Sept. 10, 1973, Ser. No. 395,959

Int. Cl.² B62B *13/16*

U.S. Cl. 280—12.14 **14 Claims**

1. A manually propelled toy vehicle such as a snowmobile, comprising:

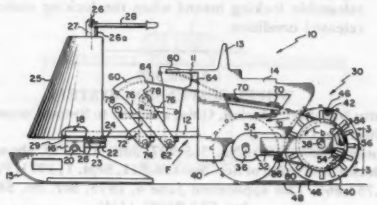
a chassis;

propelling means mounted on said chassis for engagement with a surface to be traversed and movable in a forwardly propelling path of travel;

first and second drive means mounted on said chassis for movement in independent, to-and-fro paths of travel between start and finish positions for alternately driving at least a portion of said propelling means to alternately move said propelling means in said propelling path of travel;

first and second manually actuable means on said chassis for alternately moving said first and second drive means from said start positions to said finish positions;

line means, having opposite ends anchored to said actuable means and to said drive means for alternately drawing said first and second drive means from said start positions to said finish positions as said first and second actuable



means alternately move from said start positions to said finish positions; and further line means having opposite ends connected to said first and second drive means independent of said actuable means for alternately returning said first and second drive means to said start positions on said second and first actuable means, respectively, alternately move to said finish positions.

3,960,388

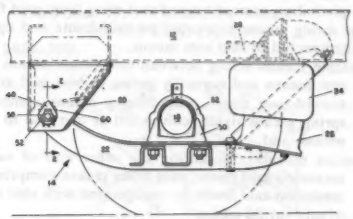
VEHICLE SUSPENSION SYSTEM AND ALIGNMENT MECHANISM THEREFOR

Don S. Strader; Lloyd G. Masser, both of Muskegon, and Robert J. Lundwall, Roosevelt Park, all of Mich., assignors to Lear Siegler, Inc., Santa Monica, Calif.

Filed Mar. 27, 1975, Ser. No. 562,444

Int. Cl.² B60G *3/26*

U.S. Cl. 280—693 **19 Claims**



1. A vehicle suspension system wherein the vehicle has a frame, an axle for mounting ground-engaging wheels, frame brackets laterally disposed at opposite sides of the frame, rigid axle control arm means with means at one end for pivotably connecting the control arm means to the frame brackets, means coupling said control arm means to said axle, at least one of said pivotable connecting means and said coupling means including a connecting plate means and adjusting means permitting fore or aft adjustment of the axle relative to the frame brackets, means for resiliently transmitting a load disposed between the vehicle frame and said axle, the improvement in said adjusting means comprising:

a mounting plate;

means for pivotably connecting the axle control arm means to the mounting plate;

means pivotably supporting the mounting plate on the connecting plate means for rotation of the mounting plate to impart precise fore or aft movement of the axle relative to the frame bracket;

means releasably locking the mounting plate to the connecting plate to fix the axle relative to the frame bracket subsequent to adjustment; and

retaining means on the mounting plate for gripping a portion of the releasable locking means to prevent relative movement between the releasable locking means and the mounting plate regardless of whether the locking means is in a locked or released condition, whereby the mounting plate can be rotated by gripping and rotating the releasable locking means when the locking means is in released condition.

3,960,389

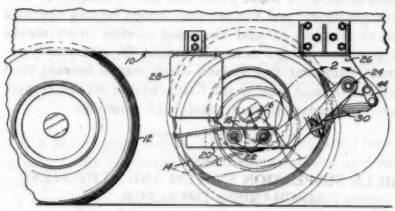
WHEEL SUSPENSION SYSTEM

Gattu Narahari, Marion, Ohio, assignor to Sycon Corporation, Marion, Ohio

Continuation of Ser. No. 365,997, June 4, 1973, abandoned, which is a division of Ser. No. 176,911, Sept. 1, 1971, Pat. No. 3,751,066. This application June 4, 1975, Ser. No. 583,669

Int. Cl.² B60G *11/46*

U.S. Cl. 280—697 **4 Claims**



1. A wheel suspension system for a wheeled vehicle having a frame, an axle and a wheel supported on said axle, said system including,

rigid arm means supporting said axle,

means pivotedly supporting one end of said arm means on said frame whereby said arm means is supported for pivotal movement toward and away from said frame,

air spring means supported on said frame and operatively connected to said arm means,

biasing means acting between said frame means and said arm means and normally acting to bias said arm means toward said frame, said biasing means comprises leaf spring means rigidly connected at one end to said arm means, and

means movably supporting the other end of said spring means on said frame, said latter means comprising roller means on said frame in engagement with said other end of said spring means.

3,960,390

INFLATOR

George W. Goetz, Detroit, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Apr. 17, 1974, Ser. No. 461,663

Int. Cl.² B60R *21/08*

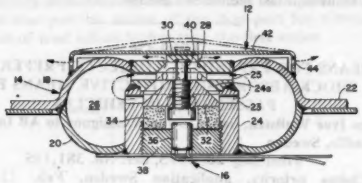
U.S. Cl. 280—731 **18 Claims**

1. An inflator for inflating an expandable confinement for restraining a vehicle occupant in response to a collision signal, said inflator comprising:

a. structure defining a source of pressurized fluid;

b. means operable upon receipt of said collision signal to activate said fluid source and permit pressurized fluid to flow therefrom;

c. outlet means for directing said fluid flow from said source including diffuser means having a member formed of generally rigid material with a plurality of exit ports disposed about the periphery thereof for directing fluid flow generally radially therefrom, said member having a central portion of substantially planar configuration with the periphery thereof secured to the structure of said fluid source, said member being deformable in the direction of flow from said fluid source in response to activation of



said fluid source from an initial generally flat position substantially restricting fluid flow to a deformed curved open position permitting substantially less restricted fluid flow to said exit ports.

3,960,391

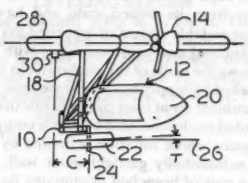
TOE-IN AND OFFSET ADJUSTMENT APPARATUS

Craig W. Vetter; John R. Doyle, both of Rantoul, and Henry P. Tate, Armstrong, all of Ill., assignors to Vetter Design Works, Inc., Rantoul, Ill.

Filed Jan. 15, 1975, Ser. No. 541,223

Int. Cl.² B62K *27/00*

U.S. Cl. 280—203 **23 Claims**



1. Apparatus for adjustably mounting a wheel to a motorcycle sidecar, comprising:

a substantially horizontal elongate rigid member secured to the sidecar and extending in the general direction of sidecar travel;

toe-in adjustment means for securing said wheel to the elongate member at different fixed angular positions relative thereto corresponding to different wheel toe-in positions; and

offset adjustment means for securing said wheel to said elongate member at different fixed positions therealong corresponding to different wheel offset positions.

3,960,392

CHILDREN'S RUNABOUT

Donald E. Read, Milwaukee, Wis., assignor to Garton Company, Sheboygan, Wis.

Filed Feb. 3, 1975, Ser. No. 546,205

Int. Cl.² B62K *9/02*

U.S. Cl. 280—282 **5 Claims**

1. In a vehicle, the combination comprising:

a frame having a pair of longitudinal side members spaced from one another and front and rear transverse members extending between the side members to form an open center cockpit area, said side members having a downward and forward incline;

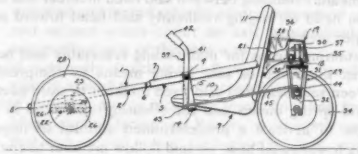
a front axle secured to said frame;

a pair of spaced front wheels mounted by said front axle that are outboard of said open center cockpit area;

a mounting member connected to said rear transverse frame member;

a pivoted rear wheel support connected to said mounting member with a wheel receiving yoke depending from said mounting member;

rear wheel means mounted by said wheel receiving yoke;



a seat in said open center cockpit area having (i) a back portion braced on said mounting member which is disposed between and straddled by said frame side members, and (ii) a cushion portion at a height beneath the run of said frame side members that is located between said front axle and said mounting member; and

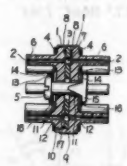
steering levers mounted by said frame side members alongside said seat which are connected to said pivoted rear wheel support for steering control thereof.

3,960,393

HOSE CONNECTOR

Hiroyuki Hosokawa, Obu; Shiro Maeda, Toyohashi, and Kenji Yamada, Anjo, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Mar. 4, 1975, Ser. No. 555,270
Claims priority, application Japan, Apr. 16, 1974, 49-43065
Int. Cl.² F16L *39/00*
U.S. Cl. 285—137 R **2 Claims**



1. A hose connector comprising:

a couple of connecting plates each of which has a plurality of pipes integrally formed on one side thereof for connection to a plurality of hoses and a plurality of endless projections formed on the other side thereof, inner passages of said pipes running through said plate, said endless projections enclosing openings of said inner passages;

a gasket between said connecting plates and having a plurality of apertures corresponding to said pipes, circumferential portions of said apertures being pressed by said endless projections for a perfect seal;

a couple of plate retainers located on said connecting plates opposite to said gasket, each plate retainer having a plurality of apertures corresponding to said pipes to pass said pipes therethrough and having slight curvature for permitting the pressing of said connecting plates to said gasket by spring action; and

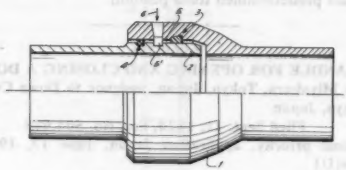
means for pressing and flattening said plate retainers thereby fixing said connecting plates, gasket and plate retainers all together to connect said inner passages of said connecting plates to each other through said apertures of said gasket.

3,960,394

PIPE UNION

Wolfgang Hübner, Leipzig, and Wilhelm Fasshauer, Halle, both of Germany, assignors to Deutsches Brennstoffinstitut Freiberg, Freiberg, Germany

Filed Aug. 16, 1973, Ser. No. 388,977
Int. Cl.² F16L *13/00*
U.S. Cl. 285—297 **13 Claims**



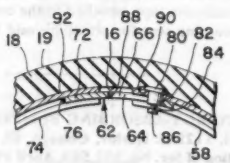
1. A rigid pipe union, particularly for large-diameter pipes which are subject to high interior pressures, comprising a pair of pipes having respective male and female end portions, the male end portion being of a substantially smaller outer diameter than the inner diameter of said female portion and being received within said female portion and defining therewith a relatively large annular clearance; a pair of sealing elements sealingly accommodated in said clearance and being spaced from one another in axial direction of said clearance; passage means communicating with said clearance intermediate said sealing elements; and a rigid body of hardened material admitted in flowable state via said passage means, accommodated in and filling said clearance intermediate said sealing elements and thereby rigidly uniting said pipes in stress-transmitting contact with said end portions thereof.

3,960,395

EXPANSION CLAMP

Fred M. Cirule, Parsippany, and Joseph R. Preziosi, Clark, both of N.J., assignors to Amerace Corporation, New York, N.Y.

Filed June 17, 1974, Ser. No. 480,268
Int. Cl.² F16L *17/00*
U.S. Cl. 285—370 **2 Claims**



1. An expansion clamp for use with a resilient tubular gasket having radially spaced axially extending inner and outer surfaces, the outer surface of said gasket adapted to engage the inner surface of a tubular body at an opening therein, said clamp comprising:

a. a circumferentially extending member adapted to be maintained in compressive relation with said radially spaced inner surface of said tubular gasket and said inner surface of said tubular body, said member having a substantially C-shaped transverse cross-section to define a channel with the opening thereof extending radially inwardly;

b. one circumferential end of said channel terminating in an end portion adapted to be received within the other circumferential end of said channel, said other circumferential end including an inwardly axially extending lip on said channel to prevent radial displacement of said one end portion; and

c. means for slidably engaging and locking said one circumferential end portion within said other circumferential end in a predetermined fixed position to maintain said compressive relation, said means including a transverse aperture contained on said circumferentially extending member disposed proximate to said one end thereof and said other end terminating in a relatively flat circumferentially extending portion having at its free end a hook-shaped part adapted to engage said transverse aperture in said predetermined fixed position.

3,960,396

HANDLE FOR OPENING AND CLOSING A DOOR

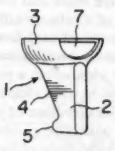
Kingo Miyahara, Tokyo, Japan, assignor to Dowa Co., Ltd., Tokyo, Japan

Filed Sept. 11, 1974, Ser. No. 504,978

Claims priority, application Japan, June 17, 1974, 49-70584[U]

Int. Cl.² E05C *21/00*

U.S. Cl. 292—347 **3 Claims**



1. A handle to be attached to a door-knob for opening and closing a door, comprising a planar main body portion which is flat in shape and extending outwardly therefrom so as to enable a finger tip to be positively applied thereto, a semicylindrical mounting seat having inner and outer surfaces extending medially and centrally relative to the outer surface of said main body portion and integral therewith so that the main body portion is attached to the outer surface of said mounting seat and extends from the middle of the mounting seat in a direction substantially normal to the axis of the mounting seat, said mounting seat being flexible so as to enable the mounting seat to be brought into intimate contact with the outer periphery of door-knobs having different sizes and shapes, and double-faced adhesive tape attached to the concave inner surface of said mounting seat for attaching said handle to the door-knob.

3,960,397

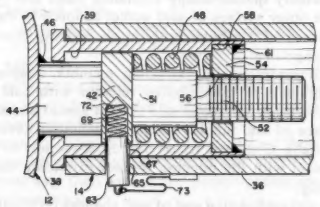
ENERGY-ABSORBING BUMPER SYSTEM

John Janci, 1125 N. Karlov, Chicago, Ill. 60651

Continuation of Ser. No. 352,580, April 19, 1973, abandoned. This application Jan. 27, 1975, Ser. No. 544,131

Int. Cl.² B60R *19/08*

U.S. Cl. 293—86 **7 Claims**



1. An energy-absorbing bumper system adapted to be mounted on a support structure, comprising:

a deformable hollow longitudinally extending bumper member;

means defining an elongated chamber adapted to be fixedly mounted on the support structure, said chamber having a fixed member disposed therein;

a piston head reciprocatively mounted within said chamber and adapted to move forwardly toward and rearwardly away from said structure;

mounting means fixedly connecting said head and said bumper member;

spring means extending between said fixed member and said piston head for urging resiliently said head toward said bumper member;

head retaining means for maintaining releasably said head against the force of said spring means to compress it between said head and said fixed member to store energy in said spring means and for releasing said head in response to at least a predetermined amount of impact acting toward said head on said hollow member to enable said spring means to exert said energy forwardly;

releasing means for causing said head retaining means to release said head upon said predetermined amount of impact being applied to said head in opposition to said force of said spring means via said bumper member and said mounting means to commence moving said head toward said fixed member;

said bumper member including an elongated gas-tight chamber extending the length of said bumper member and being oval-shaped in cross-section, said chamber being filled with a gas under pressure;

said means defining a chamber including a hole communicating with said chamber, said head including an opening therein, said head retaining means including a pin extending through said hole in said means defining a chamber and into said opening; and

said releasing means further including second spring means for ejecting said pin from said opening.

3,960,398

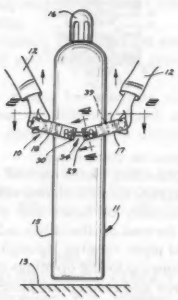
CARRIER APPARATUS

Hiram K. Johnson, 1220 Timbershore Lane, Eagan, Minn. 55123

Filed Jan. 22, 1975, Ser. No. 543,143

Int. Cl.² B66C *1/44*

U.S. Cl. 294—16 **6 Claims**



1. A carrier apparatus for manual transport of a generally cylindrical object of the type having a side wall disposed about a longitudinal axis, said carrier apparatus comprising:

a first jaw member having a first arcuate yoke contoured to substantially conform to the shape of a first segment of the side wall of the object, said first yoke having ends located generally on opposite sides of the object, an outwardly directed end flange extending from each end of the first yoke; a second jaw member having a second arcuate yoke contoured to substantially conform to the shape of the second segment of the side wall of the object,

said second yoke having ends located adjacent the ends of the first yoke and having an outwardly directed end flange extending from each end in facing relationship to the end flanges on the first yoke;

said end flanges on adjacent ends of the first and second yokes having relatively aligned holes;

coupling means coupling the adjacent outwardly directed end flanges of the first yoke and second yoke to asemble the first jaw member and second jaw member about the side wall and permit relative pivotal movement of the first and second yokes about an axis perpendicular to the longitudinal axis of the side wall ;

said outwardly directed end flanges being parallel to the pivotal axis of the first and second yokes;

said coupling means including linear coupling link assemblies coupling facing end flanges on adjacent ends of said first and second yokes, each coupling link assembly including a linear shank passing through the relatively aligned holes on an end flange of the first yoke and a corresponding end flange on the second yoke, means on the ends of the shank to prevent disengagement of the shank from the holes of the end flanges;

said first yoke having a gripping edge located adjacent the first segment of the wall means;

said second yoke having a gripping edge located adjacent the second segment of the wall means and located opposite the gripping edge of the first yoke;

each linear shank having a diameter sufficiently less than the diameter of the holes in the end flanges through which it passes to permit variance of the space defined between the first and second yokes and to permit relative pivotal movement of the first and second yokes to bring the gripping edges of the first and second yokes into engagement with the side wall of the object for lifting of the object; and

handle means rigidly secured on said jaw members adapted to be manually grasped and lifted to effect relative rotation of said first and second yokes about said axis whereby said gripping means engage the wall means to permit the lifting of the object.

3,960,399

SETTING AND RETRIEVAL DEVICE FOR DOWN-HOLE EQUIPMENT

Alex Dufrene, P.O. Box 194, Des Allemands, La. 70030

Filed Dec. 16, 1974, Ser. No. 532,996

Int. Cl.² E21B *31/02*

U.S. Cl. 294—86.25 **9 Claims**

1. A wire line supported running tool for down-hole equipment manipulation, comprising:

an elongate tapered mandrel;

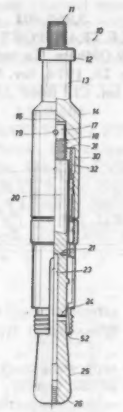
a set of collet fingers encircling said mandrel, said fingers flexing radially inwardly and outwardly dependent on their relative position adjacent to said tapered mandrel; incorporating an exposed seating surface for grasping collectively and releasing a tool to be manipulated in a well;

and collectively mounted on and movable with a slidable collar about said mandrel to positions along said mandrel where the taper thereof deflects them to grasp and release a tool;

a first cylindrical member relatively fixed to said mandrel;

a second cylindrical member relatively fixed to said collet fingers and slidably positioned relatively to said first member; and,

jar operated means cooperative with said first and second cylindrical members which selectively maintains said first



and second cylindrical members axially at a fixed relationship to grasp or release a tool.

3,960,400

LIGHTWEIGHT RAILWAY WHEEL

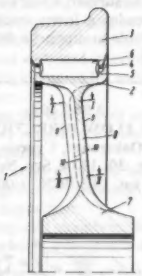
Helmut Licht, Bochum, and Willi Kasper, Wattenscheid-Hontrop, both of Germany, assignors to Fried. Krupp Huttenwerke AG, Bochum, Germany

Filed May 6, 1974, Ser. No. 467,308

Claims priority, application Germany, May 12, 1973, 2324117

Int. Cl.² B60B *3/02, 9/14, 17/00, 19/14*

U.S. Cl. 295—11 **3 Claims**



1. In a railway wheel of lightweight construction including a wheel disc body having a radially outer wheel rim and a radially inner hub; an annular constant radius outer groove being formed in said wheel rim; a wheel tire being mounted on said wheel rim; an annular constant radius inner groove being formed in said wheel tire; annularly spaced prestressed rubber insert means being inserted between said grooves for mounting said wheel tire on the wheel rim of said disc body under a tension force; and said wheel disc body being a wheel disc of an essential flat conical basic configuration being linear in the radial direction thereof and undulated between two parallel planes in the radial direction by radially extending crests and troughs, the improvement comprising: said wheel disc and said hub being of unitary stressed steel construction, the crests of the undulations being displaced relative to the troughs to increase the rigidity of said wheel disc; and said prestressed

rubber insert means being a plurality of rectangular rubber block inserts in adjacent spaced relationship to each other.

3,960,401

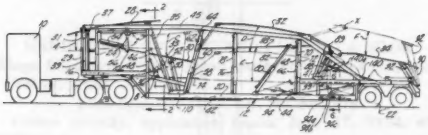
VEHICLE TRANSPORT TRAILER

Billy E. Harold, 6869 Oldham, Taylor, Mich. 48180

Filed July 25, 1974, Ser. No. 491,811

Int. Cl.² B60P *3/08*

U.S. Cl. 296—1 A **11 Claims**



1. A tractor and a vehicle transport trailer for transporting ten vehicles of the sub-compact type thereon, said trailer having

four upper vehicle supporting tracks longitudinally arrayed along the length of said trailer;

three intermediate vehicle supporting tracks further aligned longitudinally along the length of said trailer;

a pair of lower tracks, one fixed and one pivotably mounted on said trailer;

a further rearward lower pivotal track intermediate said first mentioned lower track pair;

the forwardmost of said upper tracks being slanted forwardly and operable to support a rearwardly facing subcompact car, the remaining three of the upper tracks each being successively slanted more rearwardly and operable to support a forward facing sub-compact car, the forwardmost of the intermediate tracks being substantially horizontal and operable to support a rearward facing sub-compact car, the rearward two intermediate tracks each being slanted forwardly and operable to support a different forward facing subcompact car, the forwardmost of the lower tracks being substantially horizontal and operable to support a rearward facing subcompact car, and the remaining lower tracks each slanted rearwardly and operable to support a different forward facing sub-compact car

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3,960,402

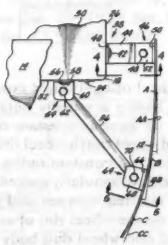
VEHICLE FLOW DIRECTION VANES

Jack L. Keck, 9665 Oakmount, Cypress, Calif. 90630

Filed Sept. 30, 1974, Ser. No. 510,443

Int. Cl.² B62C *1/00*

U.S. Cl. 296—1 S **4 Claims**



1. A vehicle flow direction vane for mounting onto rear side-to-back corners of vehicles having large substantially flat rear surfaces creating drag behind moving vehicles,

said vane having a leading edge and a trailing edge,

brackets on said vane for attaching to the side surface of said vehicle to maintain said leading edge spaced from said side surface,

brackets on said vane for attaching to the rear surface of said vehicle to maintain said trailing edge within 30° of a line extending rearwardly from said leading edge said vane having a vane surface extending from said leading edge straight and parallel to the main airstream for about 20% of the vane chord, said vane surface thereafter progressively curving inwardly as it extends rearwardly of said leading edge up to and not exceeding a 30° curvature of said vane surface relative to the main airstream.

3,960,403

RETRACTABLE ROOF CLOSURE

Richard F. Carella, Mount Clemens; Edward G. Podolan, and Francis C. Przybysz, both of Utica, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Sept. 9, 1974, Ser. No. 504,040

Int. Cl.² B60J *7/04*

U.S. Cl. 296—137 B **3 Claims**

1. In a vehicle body having a passenger compartment, a fixed roof panel supported at its forward edge by roof pillars, and a windshield header spaced from the fixed roof panel to provide an unobstructed roof opening, a retractable closure for selectively opening and closing the roof opening comprising: a one-piece rigid closure panel, a guide track mounted on the fixed roof panel on each side of the vehicle body, roller means mounted on the rear end of the closure panel and movable within the guide track means to guide and support the rear end of the closure panel, a telescopable extension device on each side of the vehicle body for guiding and supporting the front end of the closure panel, said telescopable extension device including a first member mounted along the fixed roof panel, a second member having its forward end connected to the closure panel, and a third member telescopably connecting the first and second members and permitting movement of the second member between a forwardly extended position supporting the front end of the closure panel in position closing the roof opening and a rearwardly retracted position in which the closure panel is supported in stored position beneath the fixed roof panel to open the roof opening.

3,960,404

SLIDING ROOF STRUCTURE WITH TWO-WAY OPENABLE ROOF PANEL

Horst Bienert, Gauting, Germany, assignor to Webasto-Werk W. Baier KG, Munich, Germany

Filed July 22, 1975, Ser. No. 598,077

Claims priority, application Germany, July 24, 1974, 2435551

Int. Cl.² B60J *7/04*

U.S. Cl. 296—137 F **7 Claims**

1. A sliding roof structure for automobiles, having a generally rectangular sliding roof panel which is movable out of a

matching outer roof opening in two modes, by pivoting the rear portion of the panel upwardly out of the outer opening in a venting mode, and by pivoting it downwardly and thereupon retracting the panel along lateral roof guides under the rearwardly adjacent stationary roof panel in a retracting mode, and where a downwardly offset roof frame surrounds the outer roof opening, defining at least three sides of a generally rectangular inner roof opening, and a roof canopy covers the inner roof area at the level of the inner roof opening, within and around said inner roof opening, the improvement comprising:

a transversely extending movable rain channel in operative connection with the sliding roof panel and guided for horizontal motion therewith, said rain channel being positioned vertically between the levels of the inner and outer roof openings, its normal horizontal position being underneath the rear edge of the outer roof opening, except when the sliding roof panel is opened in the retracting mode; and

a movable canopy portion covering, as part of said roof canopy, the area located within the inner roof opening when the sliding roof panel is in its closed position; said movable canopy portion including a panel canopy connected to the sliding roof panel, an a separate rear canopy portion connected to the movable rain channel.

3,960,405

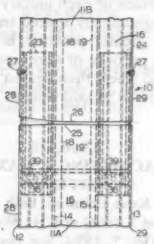
BENCH SEAT WITH END ALIGNING AND REINFORCING INSERT

David C. DeLong, 1221 Broad St., Grinnell, Iowa 50112

Continuation of Ser. No. 326,600, Jan. 26, 1973, abandoned. This application Oct. 31, 1974, Ser. No. 519,601

Int. Cl.² A47C *11/00*

U.S. Cl. 297—248 **5 Claims**



1. Mass seating equipment comprising, end-to-end positioned, multi-channeled, elongate support planks with a support surface; a front channel and a rear channel in each of said elongate support planks; channel inserts sized to be snug sliding fits inserted in the respective front and rear channels; anchor means for each of said channel inserts anchoring said inserts in an insert-receiving channel of one of each end-to-end pair of said support planks; said front and rear channels being spaced apart with a further channel means included in said elongate support planks between the front and rear channels, said further channel means being partially open to the bottom; said front and rear channels of said elongate support planks being partially open to the bottom between web lips extended from channel side walls; said channel inserts being channel-shaped with two sides and an interconnecting top, and open to the bottom by an extent greater than that defined by said channel web lips, and with the bottom extremes thereof being space-separated from the end extremes of said web lips; said channel inserts being of adequate length to extend into end-to-end positioned channels of said elongate support planks, with overlap in each giving structural alignment and mutual support to end-to-end positioned ones of said support planks; and mount means for said end-to-end positioned planks, said mount means including bolt-clip assemblies and fixed mounting flanges, said bolt-clip assemblies engaging only said web lips in a clamping action to said fixed mounting flanges through both areas of channel insert overlap and outside of channel insert overlap without bolt-clip assembly interference with said channel inserts, said end-to-end positioned support planks mountable both as seat benches and as footboards; and with said end-to-end positioned planks positioned with an expansion gap between planks ends.

3,960,406

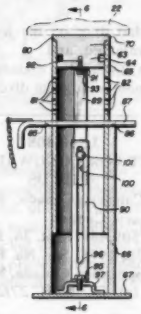
SEAT WITH ANTI-THEFT STRUCTURE

Edward Buker, Lake Forest, Ill., assignor to Coach & Car Equipment Corporation, Elk Grove Village, Ill.

Filed Jan. 13, 1975, Ser. No. 540,515

Int. Cl.² A47C *3/00*

U.S. Cl. 297—345 **9 Claims**



1. A seat assembly comprising:

a vertically disposed base member;

a vertically disposed trunnion member including means for supporting a seat;

a vertically disposed intermediate member;

means mounting said intermediate member for vertical adjustment relative to said base member;

means mounting said trunnion member for rotation about a vertical axis relative to said intermediate member and for vertical adjustment with said intermediate member;

a plurality of securing elements for securing all three of said members together;

means for preventing the removal of said trunnion member from said assembly without the removal of at least one of said securing elements;

said plurality of securing elements including at least one detachably engaged first securing element removable from a securing disposition;

and means, including said members, for preventing access to all of the detachably engageable securing elements.

3,960,407

CUTTERS AND METHODS OF CUTTING

Carl Anders Noren, Saltsjo-Boo, Sweden, assignor to Atlas Copco Aktiebolag, Nacka, Sweden

Filed Sept. 26, 1973, Ser. No. 400,824

Claims priority, application South Africa, Oct. 3, 1972, 72/7054; Oct. 3, 1972, 72/7055

Int. Cl.² E21C *25/60*

U.S. Cl. 299—17 **8 Claims**

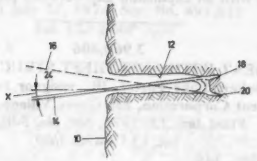
1. A method of cutting grooves in spallable material using high pressure fluid jets comprising:

directing at least two fluid jets towards the material,

causing the jets to traverse the material to form narrow slit-like cuts in the material,

mutually spacing the jets during their traverse movement in a manner to cause material portions intermediate the slit-like cuts to spall away forming a groove and

directing at least the jets forming slit-like cuts adjacent side walls of the groove in a manner such that the jets diverge relative to one another towards the base of the groove and such that each jet does not contact the side walls of



the groove so that drag on the jet by the side walls is substantially eliminated, and

advancing the jets toward the material as the cutting proceeds thereby maintaining the divergence.

3,960,408

TUNNEL LAYOUT FOR LONGWALL MINING USING SHIELDS

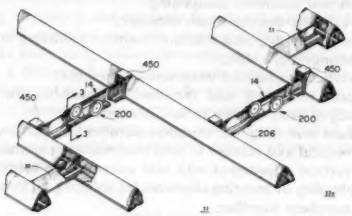
Robert W. Johns, Calgary, Canada, assignor to World Oil Mining Ltd., Calgary, Canada

Division of Ser. No. 509,489, Sept. 26, 1974. This application Oct. 28, 1975, Ser. No. 625,888

Claims priority, application Canada, Mar. 18, 1974, 195228

Int. Cl.² E21C *27/24*

U.S. Cl. 299—19 **6 Claims**



1. A mining system comprising:

a. a pair of operating tunnels horizontally spaced in parallel relationship adjacent the base of a working block of mineral deposits,

b. a mining shield comprising a plurality of arch sections arranged in side-by-side relationship and free of any permanent interconnection, each of said arch sections comprising a base portion forming a floor and a cantilever portion extending upwardly from said base portion at a generally acute angle and forming a roof, said mining shield extending between said operating tunnels such that the open side of the shield faces a mining wall,

c. an operator's pulpit positioned in each of said operating tunnels at the end of said mining shield,

c. mining equipment within said mining shield and movable along the length of said mining shield for making a mining cut while moving,

e. means in said mining shield for conveying mine material to one of said operating tunnels,

f. means for advancing said mining shield behind said mining equipment as said mining equipment progresses into the cut made by said mining equipment, and

g. means for removing detrital from the mining space into which said mining shield is to be advanced.

3,960,409

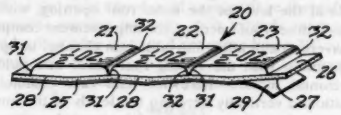
WHEEL BALANCING WEIGHT

Hubert D. Songer, Murfreesboro, Tenn., assignor to Perfect Equipment Corporation, Murfreesboro, Tenn.

Filed Nov. 25, 1974, Ser. No. 526,891

Int. Cl.² B60B *13/00*

U.S. Cl. 301—5 B **6 Claims**



1. A wheel balancing device for a vehicle having a substantially cylindrical rim portion coaxial of the wheel, comprising:

a. a plurality of pre-formed, unitary balancing weights of uniform weight and length, each weight having opposite free ends, a bottom surface and a top surface,

b. an elongated tape having a top surface and a bottom surface,

c. means securing the bottom surfaces of said weights to the top surface of said tape, said weights being in proximate end-to-end relationship longitudinally of said tape,

d. at least portions of each adjacent pair of free ends of said weights adjacent the top surfaces of said weights being proximately spaced from each other,

e. said tape being easily severable transversely of said tape between each adjacent pair of said free ends,

f. adhesive means on the bottom surface of said tape for securing said tape longitudinally circumferentially of the rim portion of said wheel,

g. the bottom surface of each unitary weight comprising at least three longitudinally spaced transverse line portions against which greater pressure is exerted through the corresponding portions of said tape by the opposing rim portions of said wheel than against any other portions of the bottom surface of said weight.

3,960,410

SYSTEM FOR ACHIEVING A MAXIMUM BRAKING EFFECT

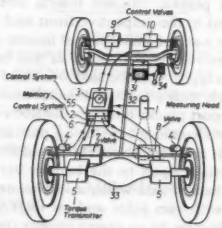
Ludwig Leitz, and Knut Heitman, both of Wetzlar, Germany, assignors to Ernst Leitz G.m.b.H., Wetzlar, Germany

Filed Oct. 7, 1974, Ser. No. 512,706

Claims priority, application Germany, Oct. 31, 1973, 2354491

Int. Cl.² B60T *8/02*

U.S. Cl. 303—21 A **15 Claims**



9. A method for determining the maximum tractive and braking effect in a vehicle provided with rubber-tired elements controllable to provide braking effort in contact with a road surface, the method comprising the steps of:

measuring previous to applied braking operation and during the normal travel of said vehicle and in consequence of said road surface any change in speed of said vehicle and

braking effort applied to said controllable elements within a predetermined time interval;

measuring simultaneously within said time interval and generating magnitude signals and sign signals of any slippage of at least one of said controllable elements;

comparing said signals received from said measurements to generate signals having characteristic values; and

applying said signals having characteristic values to indicating means and to controlling means for displaying said maximum braking effect to be expected at full braking of said vehicle and for affecting the braking operation of said controllable elements respectively.

14. An apparatus for determining the maximum braking effect at a vehicle provided with rubber-tired elements controllable to provide braking effort in contact with a road surface, the improvement comprising:

torque and rotation indicators (**4, 5**) for measuring the effective torque and wheel rpm between wheel and road previous to any braking operation and during the normal travel of said vehicle and in consequence of the changing properties of said road surface;

a speed indicator (**1**) for measuring the actual vehicle speed with respect to ground;

a comparison logic with memory (**2**) and display (**3**) for determining the maximum braking effort in response to signals from said torque and rotation indicators and said speed indicator and indicating the maximum braking effect to be expected at full braking of said vehicle; and

a control system (**6**) with braking control valves (**7, 8, 9, 10**) for acting on the vehicle brakes, when the measured values indicate an imminent collision.

3,960,411

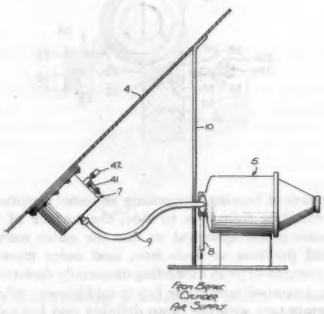
EMPTY-LOAD BRAKE WITH LADING CONTROLLED RESERVOIR

Robert G. Beacon, Sparta, N.J., assignor to Ellcon-National, Inc., Totowa, N.J.

Continuation-in-part of Ser. No. 541,266, Jan. 15, 1975, abandoned. This application July 28, 1975, Ser. No. 599,827

Int. Cl.² B60T *8/20*

U.S. Cl. 303—23 R **29 Claims**



1. A load compensating reservoir assembly for controlling the fluid pressure in a car brake cylinder and piston assembly operable by said fluid, said compensating reservoir assembly comprising a multi-walled reservoir, one of said walls being movable and in fluid-tight relationship with said reservoir and being adapted to form part of a wall of said car, a fluid valve on a wall of said reservoir, said valve having an inlet for receiving said fluid from externally of said reservoir, having an outlet opening into said reservoir and having control means for alternately opening and closing said valve and thereby permitting and preventing passage of fluid therethrough, and means internally of said reservoir interconnecting said movable wall and said control means for opening and closing said valve dependent upon the position of said movable wall.

3,960,412

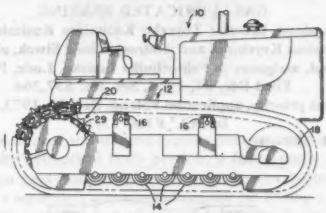
WEAR-COMPENSATING REPLACEMENT SPROCKET

James R. Shuler, Eureka, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Mar. 10, 1975, Ser. No. 556,851

Int. Cl.² B62D *55/20*

U.S. Cl. 305—57 **6 Claims**



1. A method of compensating for wear in chain and sprocket drive arrangements by maintaining a substantially matched pitch diameter of said chain and sprocket as said wear takes place, said method comprising the steps of:

constructing a sprocket of a first set of replaceable tooth segments having a predetermined pitch diameter and root diameter for adjusting the pitch diameter of said sprocket;

constructing a chain having rotatable pin bushings with at least a first wear portion engaging said first root diameter of said sprocket for adjusting the pitch diameter of said chain;

adjusting the pitch diameter of one of said sprocket and said chain to thereby maintain a matched pitch diameter of said sprocket and chain drive arrangement;

including the step of replacing said tooth segments with tooth segments having a root diameter greater than said first root diameter as said bushings wear; and,

wherein the step of constructing said chain includes constructing said pin bushings to have two wear areas, and the step of maintaining said matched pitch diameter includes rotating said pin to said second wear area when said first area becomes too worn to maintain said pitch diameter.

3,960,413

SERIES ROLL BODY CONVEYANCE

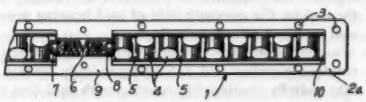
Hermann Abbuhl, Steffisburg, and Hans Tanner, Heimberg, both of Switzerland, assignors to Hydrel A.G., Romanshorn and W. Schneeberger AG, Roggwil, both of, Switzerland

Continuation-in-part of Ser. No. 416,942, Nov. 19, 1973, abandoned. This application July 7, 1975, Ser. No. 593,862

Claims priority, application Switzerland, Nov. 17, 1972, 16899/72

Int. Cl.³ F16C *21/00*

U.S. Cl. 308—3 A **3 Claims**



1. In a roller bearing cage for the support of linearly conveyed machine elements, such as machine tool carriages and the like; including elongate cage rails; and a series of roller

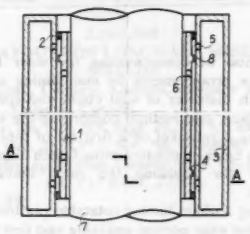
bodies being supported between said rails, the improvement comprising: spacer means in said cage positioned intermediate each of said roller bodies; said spacer means being in contact with said roller bodies, said series of roller bodies and spacer means being positioned so as to generate a frictional force responsive to relative rotation between said spacer means and said roller bodies; and at least one prestressed spring means in said cage for exerting a constant compressive spring force on said roller bodies and spacer means in the longitudinal direction of said cage.

3,960,414

GAS-LUBRICATED BEARING

Lech Andrzej Brzeski; Zbyszko Kazimierz Kazimierski; Jan Eugeniusz Krysinski, and Andrzej Witold Siwek, all of Lodz, Poland, assignors to Politechnika Lodzke, Lodz, Poland

Filed Dec. 24, 1974, Ser. No. 537,364
Claims priority, application Poland, Dec. 30, 1973, 167778
Int. Cl.² F16C *17/16*
U.S. Cl. 308—9 **1 Claim**



1. A gas-lubricated bearing comprising, in combination, a housing, elastic rings with side surfaces, a cylindrical bushing mounted in a hole in said housing by said elastic rings, chamber means formed by the outer surface of said bushing and surface of said hole as well as the side surfaces of said elastic rings; said housing having outlet holes for feeding gas into said chamber means, said bushing having inlet holes for feeding gas to the surface of the shaft to be held in said bearing, throttling elements located on the periphery of said bushing between said outlet holes and said inlet holes, and elastic baffles in said chamber means along the longitudinal axis of said bushing.

3,960,415

BEARING STRUCTURE WITH IMPROVED SEAL ARRANGEMENT

Ralph Westervelt, Pekin, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

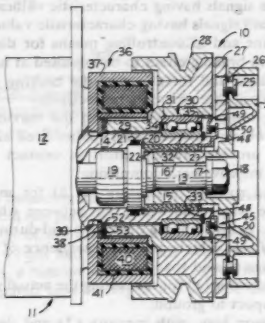
Filed Feb. 7, 1975, Ser. No. 548,110
Int. Cl.² F16C *1/24*
U.S. Cl. 308—36.1 **10 Claims**

1. In a drive mechanism including a spindle rigidly mounted at one end and a rotating member mounted for rotation about the longitudinal axis of said spindle by a bearing means; a seal comprising:

a. a first annular seal support member mounted at the free end of said spindle and extending radially outward thereof on the opposite side of said bearing means from said one end of said spindle;

b. a second annular seal support member mounted on said rotating member and extending radially inward thereof into radially overlapping relation with said first seal support member whereby an annular peripheral surface portion only of said first seal support member is disposed in opposition to an annular peripheral surface portion only of said second seal support member to define an annular volume therebetween; and

c. an annular seal member positioned within said annular volume, said annular seal member extending between said opposed surfaces of said first and second seal support



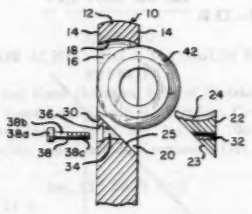
members and being bonded to one of said opposed surfaces and in rotary sealing engagement with the other of said opposed surfaces.

3,960,416

SPHERICAL BEARING HAVING ADJUSTABLE KEY

Albert R. McCloskey, Fairfield, Conn., assignor to Heim Universal Corporation, Fairfield, Conn.

Filed Jan. 20, 1975, Ser. No. 542,517
Int. Cl.² F16C *9/06, 11/06, 23/04, 25/04*
U.S. Cl. 308—72 **7 Claims**

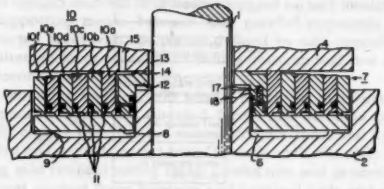


1. A spherical bearing comprising an outer member having a hole extending from side to side, the surface of the hole being concave and spherical so that the outer member has constricted portions at each side, said outer member also having a ramped keyway extending diagonally downward from said hole; a ramped removable key in said keyway whose ramp is complementary with the ramp defining said keyway in said outer member, said key also having a concave and spherical top surface corresponding to the surface of said hole so that said key has shoulder portions corresponding to the constricted portions of said outer member; and a partially spherical inner member, said inner member being held in said outer member by impingement of said spherical surface of said inner member against the constricted portions of said outer member and said key being held in said outer member by impingement of the shoulder portions of said key against said spherical surface of said inner member, adjusting and securing means to move said key along the respective ramps of said key and said keyway varying the bearing tolerance between said inner and outer member and to secure said key to said outer member.

3,960,417
HYDROSTATIC AXIAL THRUST BEARING

Charles Edward Kraus, Austin, Tex., assignor to Excelermatic, Inc., Austin, Tex.

Filed June 16, 1975, Ser. No. 587,032
Int. Cl.² F16C 1/24
U.S. Cl. 308—170 10 Claims

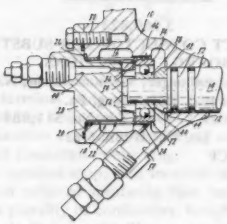


1. In a hydrostatic axial thrust bearing including: a support member; a load member disposed adjacent said support member, said load and support members having a support cavity formed therebetween; and means for admitting pressurized fluid to said support cavity for supporting said load member on said support member; the improvement comprising means for varying the effective bearing area of said support cavity in response to the load carried by said load member, thereby to permit the bearing to adjust to large load differences.

3,960,418
CANTILEVER MOUNTING

Joseph W. Bracken, Redford Township, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Nov. 7, 1974, Ser. No. 521,717
Int. Cl.² F16C 35/04
U.S. Cl. 308—184 R 10 Claims

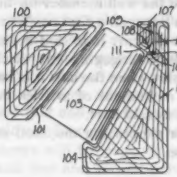


1. In a device having: a housing; an axially extending shaft, bearings journalling the shaft for rotation; and a cantilever mounting having a fixed end portion connected to the housing, a free end portion axially spaced from the fixed end and supporting one of the bearings, and an annular cage portion having a plurality of circumferentially spaced axially extending ribs connected at their opposite ends respectively to the fixed and free end portions and delimiting therebetween a plurality of slots, the ribs being operative to change the normal critial frequencies of the shaft and remove them from the normal operating range of the shaft: the improvement wherein, in at least one longitudinal section, the opposite longitudinal edges of the ribs diverge from a location intermediate the fixed and free end portions toward the fixed and free end portions.

3,960,419
BEARING COMPONENT

Thomas Scott Brawley, 3013 Mayfield Drive, Johnson City, Tenn. 37601

Filed Mar. 29, 1974, Ser. No. 456,139
Int. Cl.² F16C 33/58
U.S. Cl. 308—216 5 Claims

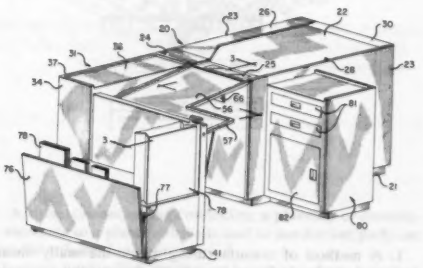


1. A channeled anti-friction bearing component comprising a generally cylindrical body portion, a frusto-conic bearing surface on said body portion constituting the bottom of a channel, a separately constructed annular rib having a surface defining the smaller end of said channel, the body portion being formed with an annular recess adjacent said smaller end and the annular rib being fitted in said recess and fused to said body by a weldment spaced from the end of said bearing surface, and an integrally formed rib having a surface defining the larger end of the channel, the metal flow in said body and said integrally formed rib running in directions which lie substantially parallel to the corresponding sides of the axial cross-section of the channel and being substantially uninterrupted.

3,960,420
CHECKOUT SYSTEM

Floyd G. Speraw, Cambridge; Thomas M. Hess, St. Clairsville, and Harold J. Sampson, Cambridge, all of Ohio, assignors to NCR Corporation, Dayton, Ohio

Filed May 8, 1974, Ser. No. 468,120
Int. Cl.² A47B 46/00, 96/18; A47F 9/02, 10/00
U.S. Cl. 312—140.1 6 Claims



1. A checkout system including
a. a checkout counter having an entrance portion at one end and a support portion at the other end, said counter having a recessed area located intermediate the ends of said counter, said recessed area defining a discharge end;
b. a cart comprising a box-like structure having a top surface extending in a horizontal direction for supporting a bag in an open position;
c. means for supporting said cart for movement;
d. a wall member secured to said structure and having a pair of side edge portions and a top edge portion located generally in the plane of said discharge end;
e. means for rotatably mounting a side edge portion of said wall member to said support portion for movement around a vertical axis to allow the cart to be moved to a

nested position in said recessed area wherein the top surface of the box-like structure is positioned adjacent the discharge end of the checkout counter and to a second position perpendicular to said nested position wherein the top surface is aligned perpendicular to the first position of the top surface;

f. a shelf member;

g. means for rotatably mounting the shelf member to the top edge portion of the wall member for movement around a horizontal axis between a first position adjacent said wall member when the cart is in said nested position and an extended position engaging the discharge end of the checkout counter when the cart is in said second position to permit the movement of articles thereover from said discharge end to said cart;

h. and means for supporting the shelf member in said extended position.

3,960,421

METHOD OF MANUFACTURING A NON-THERMALLY EMITTING ELECTRODE FOR AN ELECTRIC DISCHARGE TUBE

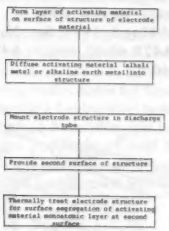
Michel Lagues, Sceaux, and Jean-Louis Domange, Antony, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 344,264, March 23, 1973, abandoned. This application Jan. 3, 1975, Ser. No. 538,326

Claims priority, application France, Mar. 27, 1972, 72.10659; Mar. 27, 1972, 72.10660

Int. Cl.² H01J 9/02

U.S. Cl. 316—17 **12 Claims**


Form layer of activating material on surface of structure of electrode material
Diffuse activating material (alkali metal or alkaline earth metal) into structure
Mount electrode structure in discharge tube
Provide second surface of structure
Thermally treat electrode structure for surface segregation of activating material monoatomic layer at second surface

1. A method of manufacturing a non-thermally emitting activated electrode for an electric discharge tube, comprising the steps of:

a. providing a structure of electrode material, said structure having a first surface for electron emission and a layer disposed at said first surface and comprising an activating material;

b. diffusing said activating material into said structure, said activating material consisting essentially of a member selected from the group consisting of an alkali metal and an alkaline earth metal;

c. mounting said electrode in the discharge tube; then,

d. providing a second surface of said structure substantially not polluted by said activating material; and

e. thermally treating at a first temperature the structure thus produced to achieve surface segregation of said activating material at said second surface as a monoatomic layer thereon.

3,960,422

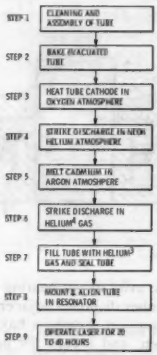
PROCESS FOR MANUFACTURING A HELIUM METAL VAPOR LASER TUBE

William A. Shull, Portola Valley, Calif., assignor to Liconix, Mountain View, Calif.

Filed Aug. 5, 1974, Ser. No. 494,892

Int. Cl.² H01J 9/18

U.S. Cl. 316—19 **17 Claims**



1. A process for manufacturing a helium metal vapor laser comprising the steps of:

providing a laser tube having a cathode, Brewster windows and a metal reservoir intermediate its ends;

filling the metal reservoir with metal;

evacuating said tube;

baking said tube at a temperature of approximately 100°C for at least 10 hours;

backfilling said tube with argon;

melting the metal in the metal reservoir;

backfilling said tube with helium gas;

sealing said tube;

mounting said tube in a resonator to form a laser; and

aligning said tube in said resonator for lasing operation.

3,960,423

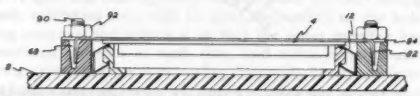
MULTI-CONTACT CONNECTOR FOR SUBSTRATE-TO-BOARD CONNECTIONS

Lawrence Paul Weisenburger, Winston-Salem, N.C., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Oct. 2, 1974, Ser. No. 511,881

Int. Cl.² H05K 1/12

U.S. Cl. 339—17 CF **17 Claims**



1. A multi-contact electrical connector for connecting corresponding terminal pads on a first panel-like member to terminal pads on a second panel-like member, said second panel-like member extending parallel to said first panel-like member, said connector comprising:

a contact terminal strip, said terminal strip comprising an elongated strip of relatively thin insulating film and a plurality of conductors of resilient spring metal adhered to said film, said conductors extending in parallel side-by-side relationship across said strip,

said conductors being reversely formed with respect to the axis of said film through an angle of substantially 180° with said conductors on the external surface thereof, each

of said conductors constituting a resilient conductor spring, each of said conductors having first and second contact zones on said external surface and intermediate the ends of said conductors, said first and second contact zones facing in opposite directions for engagement with corresponding terminal pads on said first and second panel-like members,

insulating supporting means, said supporting means having parallel oppositely directed faces for supporting said first and second panel-like members in fixed spaced-apart relation,

said contact terminal strip being mounted on said insulating supporting means between said parallel oppositely directed faces with the planes defined by said oppositely directed faces normally extending between said first and second contact zones, whereby

upon mounting said first and second panel-like members on said parallel oppositely directed faces, said terminal pads initially engage said first and second contact zones and force said first and second contact zones towards each other thereby flexing said resilient spring metal conductors and generating sufficient contact force between said terminal pads and said contact zones to form an electrical connection between corresponding terminal pads on said first and second panel-like members.

3,960,424

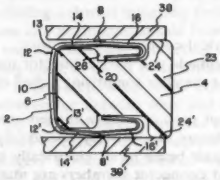
MULTI-CONTACT SPRING CONNECTOR FOR BOARD TO BOARD CONNECTIONS

Lawrence Paul Weisenburger, Winston-Salem, N.C., assignor to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 511,881, Oct. 2, 1974. This application Dec. 19, 1974, Ser. No. 534,387

Int. Cl.² H05K *1/12*

U.S. Cl. 339—17 M **20 Claims**



1. A multi-contact electrical connector for connecting corresponding terminal pads on a first panel-like member to terminal pads on a second panel-like member, said second panel-line member extending parallel to said first panel-like member, said connector comprising:

a contact terminal strip, said terminal strip comprising an elongated strip of insulating film having parallel side edges, a plurality of conductors, being of resilient spring metal, adhered to said film, and extending in parallel side-by-side relationship between said side edges with the opposite ends of said conductors being aligned along said parallel side edges,

said conductors being reversely formed with respect to the axis of said film through an angle of substantially 180° so that said terminal strip is generally U-shaped having a central web and opposed sidewalls, with said conductors on the external surface thereof, each of said conductors forming a resilient conductor spring, each of said conductors having first and second contact zones on said external surface, said first and second contact zones facing in opposite directions for engagement with corresponding terminal pads on said first and second panel-like members, and

insulating supporting means, said supporting means having first means for supporting said first and second panel-like members in fixed spaced-apart relation at a distance less than the separation of said first and second contact zones when said conductor springs are relaxed and second means for supporting said terminal strip between said panel-like members, said second means comprising multiple pivot means located adjacent to locations intermediate said edges of said strip, said pivot means comprising spaced-apart corners on said supporting means, said conductors abutting one of said corners at each juncture between each of said sidewalls and said web, and restraining means for restraining said opposite ends of said conductors against movement of said ends towards each other when said terminal strip is compressed between said panel-like members, each of said conductors being free to flex between said corners, whereby

upon supporting said first and second panel-like members on said first means, said conductors will be resiliently deformed and said contact zones will be engaged with corresponding terminal pads on said first and second panel-like members.

3,960,425

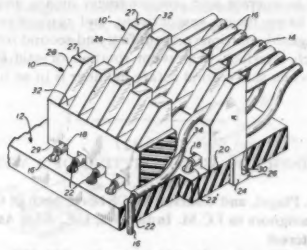
HARNESS CABLE CONNECTOR

Donald C. Kirk, Jr., Naugatuck, and Otto Morin, Newtown, both of Conn., assignors to Litton Systems, Inc., Beverly Hills, Calif.

Filed Feb. 25, 1975, Ser. No. 552,753

Int. Cl.² H01R *13/58*

U.S. Cl. 339—17 R **11 Claims**



1. A cable connector for connecting a plurality of conductive elements to a planar substrate and to conductive paths on the surface thereof, comprising:

a housing having first and second housing surfaces joined at a common edge, said first housing surface having a plurality of equally spaced slots across its full width for individually mounting said plurality of conductive elements therein;

said planar substrate having a plurality of equally spaced apertures which receive said conductive elements mounted in said slots as said second housing surface is positioned against said planar surface;

means for rolling said housing about said common edge to remove said second housing surface from its position against said planar surface and instead position said first housing surface against said planar surface for bending said plurality of conductive elements received by said planar surface apertures; and

means for locking said housing in said position with said first housing surface against said planar surface.

3,960,426

ELECTRICAL INSTALLATION

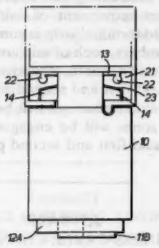
Robert Heritage, Mortlake, England, assignor to Rotaflex (Great Britain) Limited, London, England

Filed Sept. 24, 1975, Ser. No. 616,506

Claims priority, application United Kingdom, Oct. 2, 1974, 42797/74

Int. Cl.[2] H01R 13/60

U.S. Cl. 339—21 R 3 Claims



1. For use with an electrical current supply installation of the continuous outlet type comprising a channel-section track member having spaced parallel conductors extending longitudinally within said track member; a power take off adaptor comprising a housing, contact finger means movably mounted on said housing for movement between operative and inoperative positions, mechanical fixing means mounted on said housing operable to secure said housing to said track member, first and second rotary members independently and manually rotatable to operate said contact finger means and said mechanical fixing means respectively, and respective mutually interengageable portions on said first and second rotary members which interlock to prevent rotation of said first rotary member when said second rotary member is in an inoperative position.

3,960,427

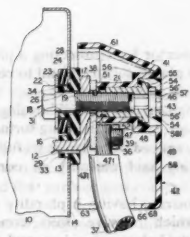
RETAINER FOR AN END FITTING OF A WELDING CABLE

Robert E. Piaget, and Charles W. Clyburn, both of Cincinnati, Ohio, assignors to I.C.M. Industries, Inc., Blue Ash, Ohio, a part interest

Filed Oct. 31, 1974, Ser. No. 519,577

Int. Cl.[2] H01R 13/44

U.S. Cl. 339—39 8 Claims



1. An end fitting retainer for welding equipment including a cabinet and a stud extending outwardly of the cabinet which comprises a nut for threadably engaging the stud, said nut having a head end, means on said head end for cooperation with a wrench, an insulative housing rotatably supporting the nut, there being a socket in the housing surrounding said head end of the nut, a flange on said head end of the nut extending radially outwardly thereof, guard means mounted in the socket, there being an opening in the guard means overlying the head end of the nut of a sufficient size to permit entry of a wrench to contact said means on said head end without permitting entry of a finger, flange means on the guard means underlying the flange of the nut to hold the guard means on the nut and in the socket, and means on the housing cooperating with means on the nut for retaining the nut in the housing.

3,960,428

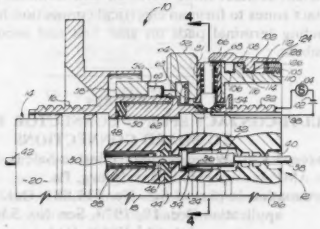
ELECTRICAL CONNECTOR

Hubert W. Naus, Monrovia, and John L. Hawkins, Jr., Pasadena, both of Calif., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Apr. 7, 1975, Ser. No. 565,344

Int. Cl.[2] H01R 13/54

U.S. Cl. 339—90 R 9 Claims



1. An electrical connector comprising:

mating receptacle and plug connector members, each said connector member comprising a shell containing an insulator;

a plurality of pairs of axially aligned contacts mounted in said insulators, respectively, the axially aligned contacts of each pair being in an electrically coupled condition when said connector members are mated;

a rotatable coupling ring on one of said shells engageable with the other shell for mating said connector members;

at least one detent pin slidably mounted in a radially extending bore in said coupling ring;

a recess in the outer surface of said one shell aligned with said pin when said connector members are mated;

means biasing said pin radially inwardly in said bore to engage said recess;

releasable means positively locking said detent pin into engagement with said recess when said connector members are mated;

said releasable locking means comprising a lock ring surrounding said coupling ring, means mounting said lock ring on said coupling ring for axial movement thereon between first and second positions, said lock ring having an inner surface adjacent to said pin dimensioned to extend over the outer end of said pin when said pin engages said recess, in said first position of said lock ring said inner surface being located at one side of said pin, in said second position of said lock ring said inner surface extending over said outer end of said pin to lock said pin in said recess, means biasing said lock ring from said first position toward said second position, and

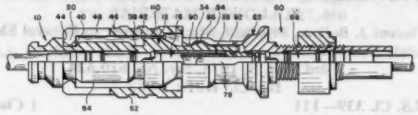
said mounting means preventing rotation between said lock ring and said coupling ring when said lock ring is in said first position and allowing rotation between said lock ring and said coupling ring when said lock ring is in said second position.

3,960,429

CONNECTOR ASSEMBLY WITH AXIALLY OPERABLE ENGAGEMENT MEANS

Norbert L. Moulin, Placentia, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Aug. 29, 1974, Ser. No. 501,553
Int. Cl.² H01R 13/54, 13/64
U.S. Cl. 339—91 R 7 Claims



1. An electrical connector assembly comprising:

a receptacle connector having means for defining an integral molded body entirely of plastic dielectric material of generally tubular construction having front and rear ends and inner and outer surfaces for receiving and securing within said inner surface at least one electrical contact with a contact engaging end thereof positioned at said front end of said receptacle connector;

a plug connector having means for defining an integral molded body entirely of plastic dielectric material of generally tubular construction having front and rear ends and inner and outer surfaces for receiving and securing within said inner surface at least one electrical contact with a contact engaging end thereof positioned at said front end of said plug connector, and being matable with said receptacle connector for electrically coupling said contact engaging ends of said respective electrical contacts of said plug and receptacle connectors;

a first of said body means of one of said plug and receptacle connectors including a shroud integrally formed with said first body means and positioned at said front end thereof for enclosing and mechanically protecting a first of said contact engaging ends, said first body shroud comprising a plurality of fingers separated from one another by means therebetween for defining slots and secured integrally at one end of said fingers to said first body for forming a plurality of cantilevers deflectable at a second end of said fingers towards and away from said first contact engaging end, said fingers having adjacent said second ends thereof means for defining reliefs undercut into said inner surface of said first body facing towards said first contact engaging end;

a second of said body means of the other of said plug and receptacle connectors including a shroud integrally formed with said second body means and positioned at said front end thereof for enclosing and mechanically protecting a second of said second contact engaging ends, said shroud having an enlarged ring section formed on said outer surface of said second body means and facing away from said second contact engaging end for latching and engaging with said undercut relief means of said first shroud fingers, said second body means further including means for defining a pair of spaced forward and rearward annular grooves formed in said outer surface of said second body means and spaced rearwardly from said first end thereof and towards said rear end thereof, said spaced annular groove means each having an annular abutment shoulder with said abutment shoulders facing one another; and

an integral molded coupling ring entirely of plastic dielectric material and of generally tubular construction having front and rear ends and positioned on said second body means for moving along said outer surface thereof, said coupling ring including a plurality of arms separated from one another by means therebetween for defining slots and integrally secured at one end thereof to said coupling ring for forming a plurality of cantilevers deflectable at a second end of said coupling ring arms towards and away from said second body means, said coupling ring arms having adjacent said second ends thereof detents facing towards said second body means for latching and engaging respectively with said spaced annular groove means and thereby for establishing a forward latching engagement with said second body means in said forward annular groove means and for aligning of said front ends of both said coupling ring and said second body means and thereby for establishing a rearward latching engagement with said second body means in said rearward annular groove means and for retracting of said coupling ring front end from said front end of said second body means;

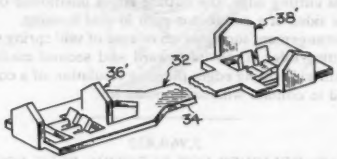
whereby, when said plug and receptacle connectors are mated for said electrically coupling of said contact engaging ends of said respective electrical contacts, and where said coupling ring is in said rearward latching engagement of said arm detents with said second body means in said rearward annular groove means, said enlarged ring section of said second body means is in engagement with said undercut relief means of said first body means, said coupling ring being thereby moveable towards said forward latching engagement of said arm detents with said second body means in said forward annular groove means for maintaining the engagement of said enlarged ring section and said undercut relief means and thereby for preventing disengagement between said plug and receptacle connectors and uncoupling of said contact engaging ends.

3,960,430

FLAT WIRING SYSTEM AND CRIMPED CONNECTION

Edward Dennman Bunnell, Palm Harbor; James Earl Fleischhacker, Clearwater, and Robert John Tennant, Seminole, all of Fla., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Oct. 29, 1974, Ser. No. 518,422
Int. Cl.² H01R 11/20
U.S. Cl. 339—97 C 17 Claims



1. A crimped electrical connection between a connecting device and a ribbon-like conductor, said conductor being contained in a thin film of insulating material:

said connecting device comprising a sheet metal member having a flat web and having sidewalls extending from two opposite edges of said web, said conductor extending across said web, said conductor having its longitudinal axis extending parallel to, and between, said sidewalls,

said sidewalls extending through said film on each side of said conductor and being bent inwardly towards each other and against said film, side sidewalls having free end portions which extend substantially parallel to said web and said film so that said crimped connection is substantially flat,

at least one contact lance struck from said web, said lance being on the same side of said web as said sidewalls and extending transversely with respect to said longitudinal axis of said conductor and towards one of said sidewalls, said lance having a leading edge which extends parallel to said axis of said conductor and which is proximate to one of said sidewalls,

said lance being flexed towards said web and being held in a flexed condition by one of said sidewalls,

portions of said insulating film on the side of said film which is against said lance being scraped from said conductor,

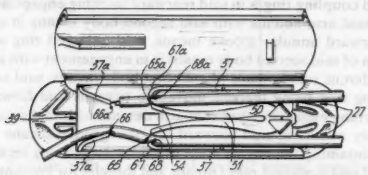
portions of said lance being against exposed areas of said conductor and in electrical contact therewith whereby, said conductor is clamped between said sidewall and said lance and electrical contact is maintained by the pressure exerted against said conductor.

3,960,431

ELECTRICAL CONNECTOR

Morley Scott MacKenzie, Ottawa; Louis Donald Charron, Greely; Andrew Philip Charles Dooley, Ottawa, and John Davidson Lee, Manotick, all of Canada, assignors to Nothern Electric Company Limited, Montreal, Canada

Filed July 21, 1975, Ser. No. 597,500
Int. Cl.² H01R 9/08
U.S. Cl. 339—98 9 Claims



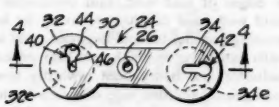
1. An electrical connector, comprising:
a housing having a base and a cover to define a hollow interior;
a holding member in said housing and including a base and flange members extending from a plane including said base;
a spring in said holding member, said spring retained in said holding member in a preloaded condition;
a first insulation cutting edge on said spring and a second insulation cutting edge on said holding member;
said second cutting edge positioned in opposition to said first cutting edge, the cutting edges positioned on opposite sides of a conductor path in said housing;
the arrangement such that on release of said spring said first cutting edge is moved toward said second cutting edge with said cutting edges piercing insulation of a conductor and in contact with said conductor.

3,960,432

STRAIN RELIEVER FOR ELECTRIC PLUG-SOCKET CONNECTION

Raymond Francis Wilbur, 3329 Quesada Drive, San Jose, Calif. 95122

Filed July 2, 1975, Ser. No. 592,559
Int. Cl.² H01R 13/58
U.S. Cl. 339—103 R 6 Claims



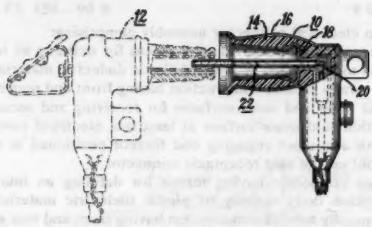
1. Strain relieving apparatus for an electrical plug on the end of an electrical cord that is plugged into an electrical receptacle having a cover plate during use of the appliance connected to the cord, said apparatus comprising a rigid body, screw means for attaching said cover plate and said body to said receptacle, said body defining at least one keyhole shaped aperture, said aperture having an upper relatively large diameter portion and a slot depending downward from said large diameter portion, said slot being bounded by a margin of reduced thickness, a ball chain having a plurality of balls joined together by a plurality of rods, said rods having a diameter sized for entry into said slot, said balls having a diameter sized for entry into said aperture and engageable on said margins to removably retain said ball chain in said slot and means for attaching the ball chain to the cord adjacent the plug.

3,960,433

SHIELDED POWER CABLE SEPARABLE CONNECTOR MODULE HAVING CONDUCTING CONTACT ROD WITH A BEVELED SHOULDER OVERLAPPED BY INSULATING FOLLOWER MATERIAL

Vincent J. Boliver, Pittsfield, Mass., assignor to General Electric Company

Filed Sept. 5, 1975, Ser. No. 610,624
Int. Cl.² H01R 13/52
U.S. Cl. 339—111 1 Claim



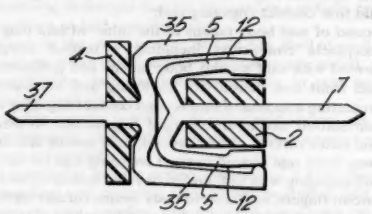
1. Apparatus for connecting electrical power cable, the apparatus being of the type having a rod contact to be received by a bore contact, the rod contact having an insulating arc follower fixed to the end for insertion into the bore, wherein the improvement comprises:
a beveled shoulder on said contact rod adjacent said follower and overlapped by the material of said follower.

3,960,434

ELECTRICAL CONNECTOR ASSEMBLY

Lucas Soes, Vught, Netherlands, assignor to AMP Incorporated, Harrisburg, Pa.

Filed Feb. 6, 1975, Ser. No. 547,678
Claims priority, application Netherlands, Feb. 14, 1974, 7402028
Int. Cl.² H01R 11/22
U.S. Cl. 339—176 M 5 Claims



1. An electrical connector assembly comprising a forked female contact having a pair of spaced cantilever contact springs extending from a yoke portion with inwardly directed lobes at their free ends receiving a complementary male contact, the male contact including a forward yoke portion with a pair of rearwardly directed, spaced cantilever contact springs diverging rearwardly from the yoke portion towards their free ends, the male contact entering the female contact by outward flexure of the contact springs of the female contact and inward flexure of the contact springs of the male contact, the flexure of the contact springs of the male contact being such that they extend rearwardly from the male yoke portion in divergent manner to an outer position and then

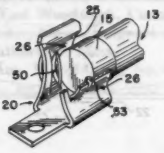
extend inwardly in convergent manner to be engaged by the lobes of the contact springs of the female contact.

3,960,435

CARTRIDGE FUSE CLIP WITH REJECTION MEANS

William R. Bailey, Chicago, Ill.; Stephen H. Krumm, Kenosha, Wis., and David R. Marach, Sleepy Hollow, Ill., assignors to Underwriters Safety Device Company, Chicago, Ill.

Filed Feb. 6, 1975, Ser. No. 547,480
Int. Cl.² H01R *13/64*
U.S. Cl. 339—186 R **4 Claims**



1. In a ferrule cartridge fuse clip including
a central base portion having means thereon for aiding in mounting said clip to an external member;
a terminal connector portion in communication with said base portion;
and a pair of fuse grasping arm members spaced apart and extending in like direction from opposing sides of said base portion for accepting and retaining an end cap portion of a ferrule cartridge fuse,
each said grasping arm member including a concave semicylindrical portion facing inwardly of said clip for providing a surface contact with the end cap of a ferrule cartridge fuse;
the improvement comprising
ridge means on each said arm member for accepting one classification of ferrule cartridge fuse and rejecting other classifications of ferrule cartridge fuses, said ridge means including an elongate segment of each said concave portion located mediate a first and a second end of said clip, and oriented generally parallel therewith, said segment extending inwardly of the remainder of said concave portion, and being stretched and stress hardened along at least one of its elongate parameters.

3,960,436

ELECTRICAL CONNECTOR

Werner Minks, Kleingeschaidt, and Manfred W. Zebisch, Georgensgmund, both of Germany, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Sept. 5, 1974, Ser. No. 503,395
Claims priority, application Germany, Sept. 10, 1973, 2345583
Int. Cl.² H01R *9/16*
U.S. Cl. 339—221 M **7 Claims**

1. In an electrical connector comprising an insulator and sheetmetal contacts of substantially rectangular cross-section tight-fittingly inserted into curved recesses in said insulator, each said contact having parallel flat broad sides, the improvement which comprises:
each said recess in said insulator having a semicircular configuration providing a straight inside wall and a curved inside wall; and
the contact in each said recess being positioned with one of its broad sides adjacent to said straight inside wall and the

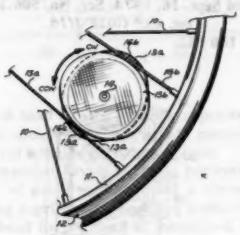
corners thereof opposite to said one side pressed into said curved inside wall.

3,960,437

QUICK ATTACHING BIKE WHEEL REFLECTOR

Robert Von Heck, P.O. Box 597, La Jolla, San Diego, Calif. 92038

Filed May 16, 1974, Ser. No. 470,634
Int. Cl.² G02B *5/12*
U.S. Cl. 350—99 **13 Claims**



1. A cyclodial type of bicycle wheel safety retro-reflector assembly, comprising: a pair of similarly formed and oppositely lateral facing wafer like elements, each element respectively displaying a like optical-reflex area with a central visual axis through which visual axis said elements are physically united by a transverse joining means; the said assembly thereby achieving instant positive spoke retension means by virtue of capturing any two adjacent wheel spokes between said united elements; thus producing secure attachment and orientation so as to serve an essentially lateral mode of visual reflectivity relative to the attendant wheel.

3,960,438

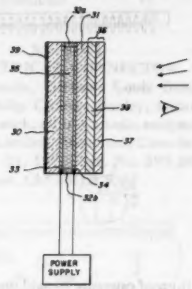
REFLECTIVE DISPLAYS

Ulrich Bonne, Hopkins, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 1, 1972, Ser. No. 311,184
Int. Cl.³ G02F *1/26*
U.S. Cl. 350—160 LC **13 Claims**

1. A reflective display utilizing ambient light and having a wide angle of view, the reflective display comprising:
an optical medium having an electrically controllable optical property,
electrode means for applying an electric field to selected regions of the optical medium to vary the electrically controllable optical property of the selected regions, and

diffuse reflector means positioned proximate one surface of the optical medium, the diffuse reflector means comprising a roughened surface and a thin reflective metal layer deposited on the roughened surface.

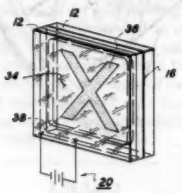


3,960,439

TEXTURE TRANSFORMATIONS IN OPTICALLY NEGATIVE LIQUID CRYSTALS

James H. Becker, Denton, Tex., and Joseph J. Wysocki, Webster, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Sept. 16, 1974, Ser. No. 506,141
Int. Cl.² G02F 1/16
U.S. Cl. 350—160 LC **24 Claims**



1. A method for transforming an optically negative liquid crystalline composition from the focal-conic texture state to the Grandjean texture state comprising the steps of:

a. providing a layer of an optically negative liquid crystalline composition comprising optically negative liquid crystalline material and an additive, said additive comprising a material selected from the group consisting of electrophoretic materials, dielectrophoretic materials, dipolar materials and mixtures thereof and providing said composition in the focal-conic texture state; and

b. applying a D.C. electrical field across said liquid crystalline layer above the Grandjean to focal-conic texture transformation electrical field strength range of said composition and sufficient to transform said liquid crystalline composition to the Grandjean texture state.

3,960,440

LIGHT OPTIC DATA HANDLING SYSTEM

Joseph T. McNaney, 8548 Boulder Drive, La Mesa, Calif. 92041

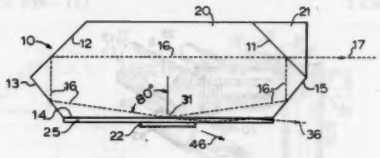
Filed May 27, 1975, Ser. No. 580,586
Int. Cl.² G02F 1/34
U.S. Cl. 350—161 **10 Claims**

1. A piezoelectric optical material light guide and light beam distributor means, comprising:

a. said light guide presenting a light admitting surface;

b. means for directing light incident upon said admitting surface along a primary optical path within said light guide while undergoing a series of reflections therein to establish an availability of light at a plurality of predetermined light output positions of said light guide for an optically controlled redirecting of light along a selected one of a plurality of secondary optical paths stemming from said positions;

c. said light guide having an array of light reflecting interfaces of first and second light conducting media presenting, respectively, first and second indices of refraction, each of said interfaces presenting a length dimension;



d. said light reflecting interfaces each angularly oriented so as to establish an optical relationship one with respect to the other and to said admitting surface for providing a series of 360° primary optical paths for said light, each said 360° path displaced one with respect to the other in a side-by-side relationship in the direction of said length dimension;

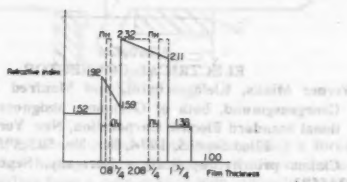
e. a plurality of light reflection control means for establishing, selectively, periodic strains in said piezoelectric material coincident with the interface of said first and second media at each of said light output positions and producing thereat a spatially varying change in the index of refraction of the material for effecting a passing of light through the interface at a selected one of said output positions and along a secondary optical path stemming from said position.

3,960,441

ANTI-REFLECTION COATING HAVING PSEUDO-INHOMOGENEOUS LAYERS

Osamu Kamiya, Yokohama, and Susumu Itoh, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 402,909, Oct. 3, 1973, abandoned.
This application June 5, 1975, Ser. No. 583,969
Claims priority, application Japan, Oct. 6, 1972, 47-100388
Int. Cl.² G02B 5/28
U.S. Cl. 350—164 **4 Claims**



1. An anti-refraction coating for use in reducing light reflection off the surface of a transparent substrate, said coating comprising seven sub-layers which are superposed on each other by vacuum evaporation, said sub-layers being designated from 1 to 7 in consecutive numerical order from the substrate, respectively; the odd-numbered sub-layers 1, 3, 5 and 7 being composed of a material having a low refractive index, the even-numbered sub-layers 2, 4, and 6 being composed of a material having a high refractive index, each sub-

layer having an associated optical thickness value as follows:

first sub-layer	=	$(0.04 \pm 0.004)\ \lambda/4$
second sub-layer	=	$(0.23 \pm 0.15)\ \lambda/4$
third sub-layer	=	$(0.37 \pm 0.15)\ \lambda/4$
fourth sub-layer	=	$(0.69 \pm 0.15)\ \lambda/4$
fifth sub-layer	=	$(0.22 \pm 0.15)\ \lambda/4$
sixth sub-layer	=	$(0.59 \pm 0.15)\ \lambda/4$

and the seventh sub-layer = $\lambda/4$, whereby said first, second and third sub-layer behave as a single inhomogeneous layer and said fourth, fifth and sixth layers behave as a single inhomogeneous layer.

3,960,442

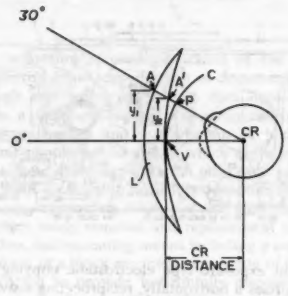
OPHTHALMIC LENS SERIES

John King Davis, East Woodstock, Conn., and Henry Grant Fernald, Winchester, Mass., assignors to American Optical Corporation, Southbridge, Mass.

Filed Aug. 5, 1974, Ser. No. 494,784

Int. Cl.² G02C 7/02

U.S. Cl. 351—176 **19 Claims**



1. A general purpose ophthalmic lens series comprising lenses formed of a transparent material of known refractive index and providing a plurality of predetermined spherical prescriptive powers within a range of +10.00 diopters to −10.00 diopters combined with cylindrical prescriptive powers within a range of 0.00 diopters to at least −3.00 diopters, each of said lenses having disposed upon one surface thereof a concave base curve having at the lens axis a spherical dioptric power value as indicated for each combination of spherical and cylindrical prescriptive powers in the table of FIGS. 8A and 8B, nominal convex front curves being conventionally calculable, each lens further having on its combined front and back surfaces an aspheric correction E of net asphericity at an intercept of a 20° angle of view for a 30mm center of rotation distance such that residual tangential power errors are between +0.1 diopter and −0.2 diopter for spherical prescriptions and for both meridians of spherical prescriptions combined with cylinders of values from 0 to −4.00 diopters, said aspheric correction E being determined according to the formula E =

$$\left(\frac{n-1}{Do\ Y}\right)^2 \left[1-\left(\frac{Do}{Do+asph}\right)^{2/3}\right]$$

wherein n is said known refractive index, Do is the diopter value of the curve of a surface under consideration taken at the lens axis, Y is the height from the lens axis of the intercept of said angle of view and asph is a value opposite in sign to the tangential power error requiring aspheric correction at said intercept as may be determined by standard ophthalmic lens ray trace procedure.

3,960,443

OPTICAL HEAD MOVING DEVICE

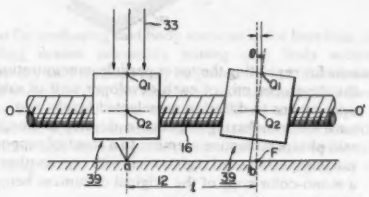
Takeshi Goshima, Tokyo; Yoshinori Sugiura, Kawasaki; Kiyonobu Endo; Hideaki Sato, both of Yokohama; Kimio Kono, and Takao Tsuji, both of Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed June 11, 1975, Ser. No. 585,822

Claims priority, application Japan, June 21, 1974, 49-71000

Int. Cl.² G02B 7/02; G11B 7/08

U.S. Cl. 350—247 **11 Claims**



1. An optical head moving device comprising:

a pair of parallel, spaced apart guide members having the axes thereof lying on a common plane;

a movable member having engaging portions engaged with said pair of guide members and a connecting portion connecting together said engaging portions;

an optical head for focusing an introduced light beam securely mounted on said movable member in such a manner that a principal point at the projection-side of said optical head lies on the plane containing the axes of said pair of guide members;

means for introducing a light beam into said optical head; and

means for moving said optical head by moving said movable member in a state of said engaging portions being in engagement with said guide members.

3,960,444

ELECTROPHOTOGRAPHIC PRINTING MACHINE

Robert W. Gundlach, Victor; Charles A. Whited, and Thomas W. Pike, both of Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 14, 1974, Ser. No. 497,547

Int. Cl.² G03G 15/09, 15/00

U.S. Cl. 355—3 DD **22 Claims**

1. An electrophotographic printing machine, including:

a photoconductive member;

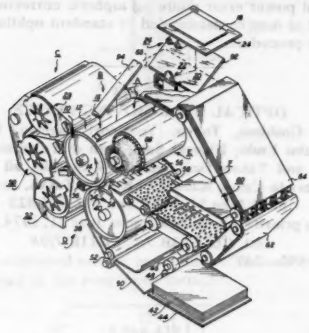
means for charging said photoconductive member to a substantially uniform level;

means for exposing said charged photoconductive member to a light image recording an electrostatic latent image thereon, said exposing means forming successive light images of differing predetermined intensities from the same original document;

means for developing the successive electrostatic latent images recorded on said photoconductive member by

contacting the latent images with a developer mix of carrier granules and toner particles, said developing means comprising a plurality of developer units comprising developer mixes having the same color toner particles with concentrations thereof being different in each developer unit;

means for electrically biasing each developer unit of said developer means to differing preselected levels;



means for regulating the toner particle concentration within the developer mix of each developer unit of said developer means to differing preselected levels; and

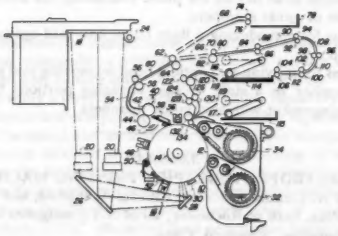
means for transferring successive developed images from said photoconductive member to a sheet of support material in superimposed registration with one another to form a mono-color copy of the original document being reproduced.

3,960,445

COLOR HIGHLIGHTING ELECTROPHOTOGRAPHIC PRINTING MACHINE

William A. Drawe, Penfield, N.J., assignor to Xerox Corporation, Stamford, Conn.

Filed Feb. 13, 1974, Ser. No. 442,037
Int. Cl.² G03G *15/22*
U.S. Cl. 355—4 **7 Claims**



1. An electrostatographic printing machine of the type having successive differently colored powder images deposited on an image bearing member and means for transferring the differently colored powder images from the image bearing member to different portions of a sheet of support material, wherein the improvement includes:

a receiving station;

a supply station;

a plurality of transport members connecting said supply station with said receiving station defining a plurality of paths therebetween;

means for advancing the sheet of support material along one of said plurality of transport members from said supply station to said receiving station with a first one of said transport members moving the sheet of support material to said receiving station after the transfer of a single powder image to a first surface thereof, and a second one of said transport members recirculating the sheet of support material so that successive differently colored powder images are transferred to different portions of the first surface thereof as the sheet of support material advances from said supply station to said receiving station;

means operatively associated with said advancing means, for selecting one of said plurality of transport members for moving the sheet of support material therealong; and

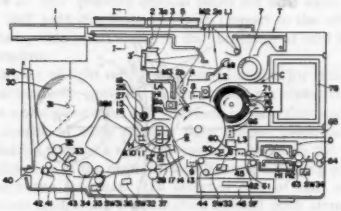
means for inverting the sheet of support material so that said advancing means moves the sheet of support material along one of said transport members, thereby transferring at least one powder image to a second surface opposed from the first surface of the sheet of support material.

3,960,446

ELECTROSTATIC COPYING APPARATUS

Masaya Ogawa; Kenichi Wada, both of Sakai, and Yoshihiko Yasue, Toyohashi, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Azuchi, Japan

Filed Apr. 30, 1974, Ser. No. 465,674
Claims priority, application Japan, May 8, 1973, 48-50869
Int. Cl.² G03G *15/00*
U.S. Cl. 355—13 **3 Claims**



1. In a slit exposure type electrostatic copying apparatus which comprises a horizontally, reciprocating movable transparent platform to place an original to be copied thereon, a photoreceptor drum rotatably provided under said platform and having the surface thereof movable along a path relative to a plurality of processing stations, such as preliminary charging, exposing, developing, transferring, residual toner removing and discharging stations disposed along said path, each of said stations being actuable in timed relation to the rotation of said drum, means for feeding copy paper sheets, a main light source operatively positioned for illuminating an original to be copied, means for fixing toner powder images on said copy paper sheet and means for carrying said fixed copy paper sheets out of said copying apparatus, an improvement thereof for erasing the preliminary charge from said photoreceptor surface which comprises a supplementary light source for illuminating the portion of the surface of said photoreceptor drum on which no latent image is formed so as to remove unnecessary charge from said photoreceptor surface, said supplementary source being provided in the vicinity of said exposing station, a switch being operatively coupled to said main light source and said supplementary light source for turning said supplementary light source on only when said main light source is off as said photoreceptor drum rotates, said supplementary light source being directed toward approximately the same point along the path of movement of the surface of the photoreceptor drum as the point at which the light rays from said original are directed, said supplementary light source illuminating said photoreceptor surface only when it is turned on to remove unnecessary charge from the portion of the photoreceptor surface on which no latent image is formed, and said photoreceptor drum being adapted to com-

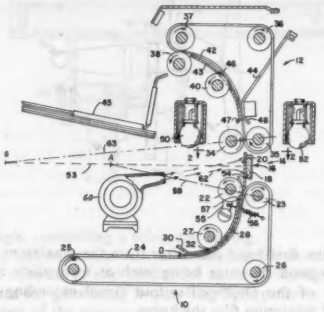
plete one copying cycle per two revolutions thereof with said drum stopping at its starting position at every copying cycle.

3,960,447

LOCATING AND LOCKING MECHANISM FOR GLASS FLAT

Eugene Sather, Deerfield, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed Nov. 15, 1974, Ser. No. 524,301
Int. Cl.² G03B *27/62*
U.S. Cl. 355—75 **15 Claims**



1. In a microfilm recording machine of the type which makes a photographic reproduction of documents processed therethrough and which includes a document input feed mechanism, a document exit and a scanning zone between the input feed mechanism and exit wherein each document is scanned and photographed and in which there is disposed a single glass plate member with a flat glass face against which each document is caused to lie as it is transported through the scanning zone, a mounting means for said glass plate member which enables ready removal and replacement of said glass plate member, said mounting means including a support member in the form of a block mounted at one side of the machine and constructed to provide horizontally disposed upwardly opening guideway forming means for cooperation with portions of said glass plate member in supporting in sliding relation therein and glass plate member while it is moved into and/or out of operative position in the scanning zone.

3,960,448

HOLOGRAPHIC INSTRUMENT FOR MEASURING STRESS IN A BOREHOLE WALL

James L. Schmidt, Redondo Beach; Jerold L. Jacoby, Long Beach; Garrett D. Shaw, Rancho Palos Verdes, and Pravin G. Bhuta, Torrance, all of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed June 9, 1975, Ser. No. 585,269
Int. Cl.² G01B *11/16;* **E21B** *49/00*
U.S. Cl. 356—32 **13 Claims**

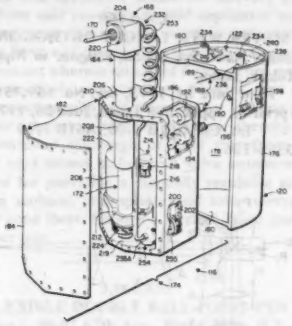
1. A holographic instrument to be positioned within a borehole for determining the stress in the borehole wall, comprising:

an elongate body which extends lengthwise of the borehole in which the instrument is positioned;

said body having separable body sections;

a holographic recording system in one body section including means for holding a holographic recording medium having a field of view in a transverse direction of said body, whereby when the instrument is positioned in a borehole, a surface region of the borehole wall is situated in said field of view, and means for recording first and second holograms of said wall region in succession on said recording medium to produce on said medium a double exposure hologram of said wall region;

means on the other body section for cutting a stress relief in the borehole wall in stress relieving relation to said wall region in the interval between recording of said first and second holograms, whereby said double exposure hologram contains information representing the stress in said wall region;



means for anchoring said body sections in the borehole; and

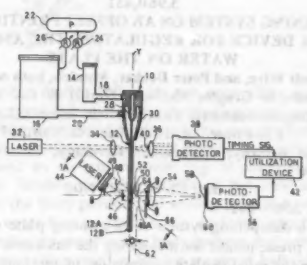
coupling means releasably joining said body sections, whereby said sections may be joined for introduction into and removal from the borehole, and said coupling means may be released when said sections are anchored in the borehole to mechanically isolate said sections from one another and thereby permit operation of said stress relief forming means without disturbing said holographic system.

3,960,449

MEASUREMENT OF ANGULAR DEPENDENCE OF SCATTERED LIGHT IN A FLOWING STREAM

Joseph G. Carleton, and Richard G. Sweet, both of Palo Alto, Calif., assignors to The Board of Trustees of Leland Stanford Junior University, Stanford, Conn.

Filed June 5, 1975, Ser. No. 583,883
Int. Cl.² G01N *21/00*
U.S. Cl. 356—103 **22 Claims**



1. A particle scattering system employing radiation scattering wherein there is relative movement between the particle and analyzing system comprising,

means for moving the particle along a scatter line,

means including a radiation source arranged to project a beam of radiation onto said scatter line,

detector means having a radiation acceptance geometry whose projection intercepts said beam along the scatter line,

said projected acceptance geometry including aperture means located adjacent the scatter line and having a dimension in the direction of travel of the particle along

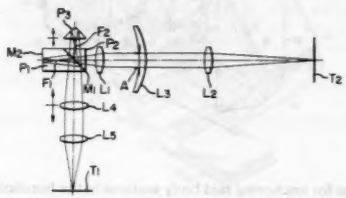
the scatter line substantially less than the length of the scatter line such that the angle of scatter radiation detectable by the detector means from said particle varies according to the position of the particle along the scatter line.

3,960,450

LENS METER WITH TARGET ORTHOGONALIZER

Masao Nohda, Kawasaki, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed June 24, 1975, Ser. No. 589,751
Claims priority, application Japan, June 28, 1974, 49-73971
Int. Cl.² G01B *9/00*; A61B *3/10*
U.S. Cl. 356—126 **5 Claims**



1. A lens meter for measuring the focal length of a sample lens with the sample lens disposed in a collimated light beam, comprising:

a target;

a first lens for forming an image of the target;

light beam splitter means in the light beam on the image forming side of the first lens for splitting the light beam to form a first and a second target image;

a second lens having its focal points on the first and second target images through the light beam splitter means;

target orthogonalizing means provided between the first and second lenses for making the first and second target images orthogonal to each other;

a third lens for focusing the orthogonal target images collimated by said second lens; and

target viewing means at the focal point of the third lens.

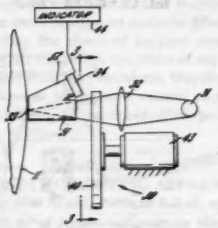
3,960,451

DAMPENING SYSTEM ON AN OFFSET PRINTING PRESS WITH A DEVICE FOR REGULATING THE AMOUNT OF WATER ON THE PLATE

Burkhardt Wirz, and Peter Decker, Munich, both of Germany, assignors to Grapho Metronic GmbH & Co. and Roland Offsetmaschinenfabrik Faber & Schleicher AG., Germany

Filed Mar. 14, 1975, Ser. No. 558,307
Claims priority, application Germany, Mar. 14, 1974, 2412234
Int. Cl.² G01B *11/00*
U.S. Cl. 356—161 **2 Claims**

1. In a dampening system for a printing plate of an offset printing press, means for measuring the thickness of a film of water on the moving plate comprising, in combination, a light source forming a beam of light directed at the water film to form a spot of light thereon, light pick-up means including a photocell having a pick-up axis directed at the spot of light so as to produce an output signal responsive to the remitted light, a first band pass filter passing a wavelength (slightly) separated from a maximum light absorption band of water by a difference in wavelength lying within the range of 0.05 and 0.25 micron, a second band pass filter passing a wavelength which is (well) separated from the maximum light absorption band of water by at least about 0.5 micron and which lies in a region of minimum change of absorption with film thickness, means for interposing the filters in time sequence in the path of the light reaching the photocell so that the photocell is subjected to an alternative series of measuring light pulses and reference light pulses through the respective filters, and means responsive to the pulsating output of the photocell for providing a direct indication of film thickness, the degree of separation of the first band pass filter from the maximum light absorption band of water being such as to provide improved linearity of the photocell output signal extending into the range of maximum film thickness.

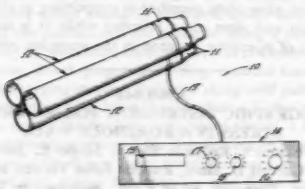


3,960,452

COLOR MONITOR UTILIZING AMBIENT LIGHT ILLUMINATION

Victor R. Huebner, Fullerton, Calif., assignor to Technical Hardware, Inc., Fullerton, Calif.

Filed Mar. 5, 1975, Ser. No. 555,357
Int. Cl.² G01J *3/50*
U.S. Cl. 356—173 **7 Claims**



1. A color analyzer simultaneously responsive to light intensity at multiple wavelength regions emitted by or reflected from a specimen illuminated by existing ambient light for instantaneously determining relative ratios of said wavelength regions comprising:

a plurality of photodetectors having different spectral response characteristics;

a separate optical probe for each photodetector for imaging the light emitted by or reflected from said specimen onto its associated photodetector, said optical probes having identical dimensions and imaging characteristics and being arranged in side-by-side, parallel relationship in order to permit each optical probe to be affected equally by ambient light changes; and

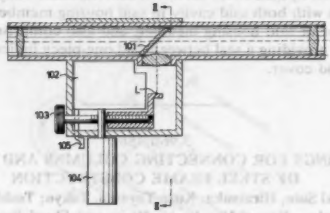
means responsive to the outputs of said photodetectors for ratioing said outputs and providing the resultant ratio signals for utilization.

3,960,453

ELECTRONIC TELESCOPIC SIGHT

Sven Torsten Arnold Svensson, and Sven William Bjelvert, both of Eskilstuna, Sweden, assignors to Forenade Fabriksverken, Eskilstuna, Sweden

Filed Dec. 16, 1974, Ser. No. 533,132
Claims priority, application Sweden, Dec. 20, 1973, 7317195
Int. Cl.² G02B 23/10
U.S. Cl. 356—252 10 Claims



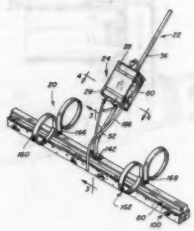
1. A sight comprising a telescope having:
at least one horizontal row of luminescence diodes;
means coupled to said diodes for successively lighting the diodes for generating a travelling light point in the field of view of the telescope;
means coupled to said generating means for manually adjusting the travelling speed of said light point so as to cause said light point to follow a target;
means for manually setting the distance to the target;
means coupled to said diodes for manually extinguishing the travelling light point when it has been caused to follow the target and when the distance is set; and
means for lighting one of said diodes in response to the adjusted travelling speed of the light point and to said setting of the distance, said lit diode corresponding to correct lead and correct superelevation so as to serve as an aiming point.

3,960,454

APPARATUS FOR CLEANING BOWLING LANES

Kenneth K. Schroeder, Jr., Rte. 3 Box 56, Antioch, Ill. 60002

Filed June 5, 1975, Ser. No. 583,957
Int. Cl.² A47L 13/46
U.S. Cl. 401—140 2 Claims



1. In apparatus for cleaning and treating bowling alley lanes and similar floor surfaces, said apparatus including, in combination, handle means for propelling and manipulating said apparatus along a work surface to be treated,
a reservoir adapted to contain a supply of liquid for application to the surface to be treated,
applicator means including means adapted for sliding frictional engagement with a work surface to be treated to apply treating liquid thereto across a substantial lateral expanse thereof,
securement means interattaching said handle means, said reservoir, and said applicator means to provide a composite functional assembly, and
fluid conducting means communicating between said reservoir and said applicator means for delivery of treating liquid from said reservoir to said applicator means, and fluid flow control means for regulating the rate of fluid delivery from said reservoir to said applicator means, the improvement wherein said fluid flow control means comprises selectively adjustable air bleeder vent means in communication with said reservoir for limiting and regulating air admission into said reservoir thereby to facilitate controlled discharge of fluid therefrom, said air bleeder vent means including a valve connected to said reservoir for providing a manually regulable air passage between ambient atmosphere and said reservoir at an interior zone thereof above a level of liquid contained in said reservoir.

3,960,455

FLEXIBLE DOUBLE BALL-POINT PEN

Max Balassiano, 98-01 67th Ave., Forest Hills, N.Y. 11374

Filed July 7, 1975, Ser. No. 593,323
Int. Cl.² B43K 7/00, 7/10
U.S. Cl. 401—209 4 Claims

1. A flexible double ball-point pen comprising an aligned body portion and writing portion, the body portion and writing portion being constructed to be movable out of alignment by flexing in response to pressure and direction of movement of a user's hand by an intermediate ring of compressible and expandable flexible material interfitted between and connected into the body portion and writing portion by means of oppositely extending projections on said ring which fit into complementary recesses in the body portion and writing portion and the writing portion having a pair of ball-point balls held together against disassembly in a sleeve at the lower end of the writing portion and said sleeve being provided with a supply of ink.

3,960,456

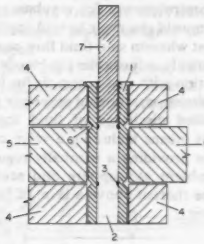
INCIPIENT SHEAR PIN FAILURE INDICATING MEANS

Kenneth Edward Norris, Somerset, Colo. 81434

Filed Nov. 25, 1974, Ser. No. 527,126
Int. Cl.² B25G 3/00; F16D 1/00; F16G 11/00
U.S. Cl. 403—27 1 Claim

1. A shear pin pending failure detection means comprising in combination a hollow, permanently deformable shear pin

and a plug gauge gauging member which is slidably receivable in said hollow shear pin, said shear pin having a smooth, cylindrical bore of a substantially constant, predetermined, first diameter extending coaxially therethrough; said plug gauge being cylindrical and having a second predetermined diameter which is slightly less than said first predetermined



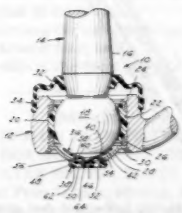
diameter, said gauge being receivable through said bore with a slip fit when said shear pin is undeformed; and an at least partially circumferential internal deformation on the internal surface of said shear pin which decreases the effective diameter of said bore within said shear pin, whereby full insertion of said gauge through said shear pin is prevented and possible incipient failure of said shear pin is indicated.

3,960,457

WEAR INDICATOR FOR BALL JOINTS

Donald R. Gaines, Farmington, and Bronko F. Jelenic, Ann Arbor, all of Mich., assignors to Gulf & Western Manufacturing Company (Michigan), Southfield, Mich.

Filed Dec. 20, 1974, Ser. No. 535,015
Int. Cl.² G01D 11/02; F16C 11/06
U.S. Cl. 403—27 11 Claims



1. A ball joint wear indicator comprising, a housing member having a cavity extending generally axially therethrough, a ball stud member having a stud with an integral ball thereon mounted in said cavity of said housing member with said stud projecting generally axially beyond said cavity to the exterior of said housing member for movement of said ball stud member with respect to said housing member, an end cover adjacent the other end of said cavity and also adjacent a generally polar region of said ball and being fixedly carried by said housing member, an actuator bearing on the generally polar region of said ball adjacent said cover, and a one-piece indicator body having a first portion fixedly carried by said cover, a second portion operably connected with said actuator, and a membrane portion homogeneously integral with said first and second portions and yieldably biasing said actuator into engagement with said ball, a reference surface on said first portion of said indicator body, said reference surface being accessible from the exterior of and in fixed relation to said housing member, an indicator surface on said second portion of said one-piece indicator body, said indicator surface being accessible from the exterior of said housing member and operably associated with said actuator for generally axial movement relative to said reference surface in response to generally axial movement of said ball relative to said housing member, and said indicator and reference surfaces of said one-piece body being constructed and arranged to lie in the same plane prior to any in-service wear of the ball joint such that thereafter the extent of any displacement of said reference and indicator surfaces relative to each other provides an indication of the extent of in-service wear of the ball joint.

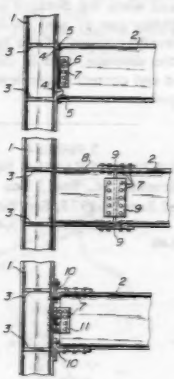
2. The wear indicator of claim 1 wherein said indicator body is carried by said cover such that said indicator body communicates with both said cavity in said housing member and the exterior of said housing member, and also comprises sealing means providing a seal between said one-piece indicator body and said cover.

3,960,458

FITTINGS FOR CONNECTING COLUMNS AND BEAMS OF STEEL FRAME CONSTRUCTION

Kuniaki Sato, Hiratsuka; Kozo Toyama, Tokyo; Toshio Saheki, Kodaira; Kaoru Mizukoshi, Hino, and Shuei Suzuki, Machida, all of Japan, assignors to Kajima Corporation and Hitachi Metals Ltd., both of Tokyo, Japan

Filed Feb. 26, 1975, Ser. No. 552,969
Claims priority, application Japan, Mar. 1, 1974, 49-23975
Int. Cl.² F16B 7/08
U.S. Cl. 403—189 6 Claims



1. A unitary fitting for connecting columns and beams of steel construction, each fitting comprising a base plate having a flat surface for substantially uniform face-to-face contact with said column and for connecting a beam with said column, said fitting including an outwardly extending protrusion formed substantially centrally on its opposite surface, said fitting further including a flat plate in connecting facial contact with the flange of said beam, said beam contacting plate forming a generally T-shaped section with said base plate and being thicker than said beam flange.

3,960,459

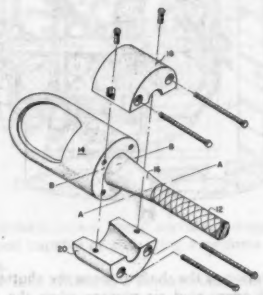
REDUCED SHEAR STRESS END FITTING

Frederic S. Hering, Chesapeake, Va.; Robert H. Ohlbaum, Silver Spring, and Joseph R. Crisci, Bowie, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation-in-part of Ser. No. 239,478, March 30, 1972, abandoned. This application June 6, 1974, Ser. No. 476,821

Int. Cl.² B25G *3/34*; F16B *11/00*, *12/04*; F16L *13/00*

U.S. Cl. 403—267 5 Claims



1. A stranded cable tensile member; a regular truncated conical member molded to one end of said tensile member coaxial with said tensile member and integrally joined thereto; and a separable force-transmitting member having a mating interior conical surface surrounding said conical member for less than the total axial length of said conical member starting at the maximum diameter of said conical member, said force transmitting member having a minimum inner diameter greater than the minimum outer diameter of the tensile member said tensile force being applied over approximately half of the length of the conical member.

3,960,460

CONNECTOR FOR ELEMENTS MADE OF STRUCTURAL FOAM

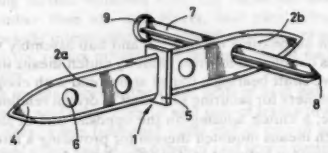
Artur Fischer, Altheimer Strasse 219, D-7241 Tumlingen, Germany

Filed July 11, 1974, Ser. No. 487,806

Claims priority, application Germany, July 14, 1973, 2335908

Int. Cl.² F16B *7/00*, *5/00*, *12/24*, *13/12*

U.S. Cl. 403—292 6 Claims



1. A connector for elements made of structural foam, comprising a first and a second elongated planar blade-shaped connecting portion having tips, each of said connecting portions having cutting edges adapted to cut a slit-like incision into the structural foam elements as said connecting portions penetrate therein, said connecting portions being connected with one another and each having at least one hole extending transversely of its elongation; a pair of elongated locking members each adapted to be driven into one of said structural foam elements and through one of said holes, so as to extend transverse of the respective connecting portion and lock the same to the structural foam element; and an intermediate portion located between and connected with said correcting portions and forming an abutment flange for said structural foam elements, said cutting edges diverging continuously from said tips to said intermediate portion so that said connecting portions can penetrate and be extracted from said structural foam elements via said slit-like incision without causing crumbling of the latter.

3,960,461

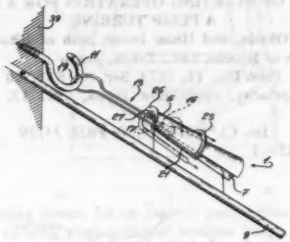
DROP WIRE CLAMPS

Isaac Sachs, 2685 Kent Ave., Montreal, H33 1M8, Quebec, Canada

Filed Apr. 7, 1975, Ser. No. 565,687

Int. Cl.² F16G *11/04*

U.S. Cl. 403—368 17 Claims



1. A wedge clamp for securing a cable to a support, said clamp comprising:

an inner member having a generally conical outer surface configuration and a longitudinal groove formed in the outer surface for receiving the cable, the depth of said groove being less than the thickness of the cable to be received therein, and further having a means for securing said inner member to the support; and

an outer sleeve mounted over said inner member, said outer sleeve having an inner surface configuration corresponding generally to the conical outer surface configuration of said inner member, said inner surface having a dented portion for receiving said cable, and further having a longitudinal slot of sufficient width for passing into said outer sleeve the cable to be received in said groove;

the inner surface of said outer sleeve slidably engaging the outer surface of said inner member along its longitudinal length in a close fitting relationship, the space between said longitudinal groove and said dented portion of said sleeve constituting a cable securing opening; and

said outer sleeve being rotatable around said inner member when said outer sleeve is disengaged from said inner member.

3,960,462

SEALING MEMBER

James J. Kerschner, Tonawanda, N.Y., assignor to Acme Highway Products Corporation, Buffalo, N.Y.

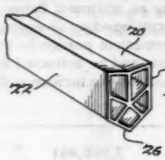
Filed July 21, 1975, Ser. No. 597,458

Int. Cl.² E04C *11/10*

U.S. Cl. 404—64 11 Claims

1. A sealing member comprising: a resiliently yieldable tubular body having a top wall, a bottom wall and opposite sidewalls, an internal truss structure including a pair of crossbars extending downwardly at an angle from said sidewalls at points spaced below the upper ends thereof to said bottom wall at points spaced from the opposite ends thereof, said crossbars intersecting intermediate their opposite ends, and a generally vertically disposed compression bar extending from

the midportion of said top wall to a termination with the intersection of said crossbars for reducing and equalizing the



pressure along said sidewalls during compression of said member.

3,960,463

METHOD OF STARTING OPERATION FOR A PUMP OR A PUMP TURBINE

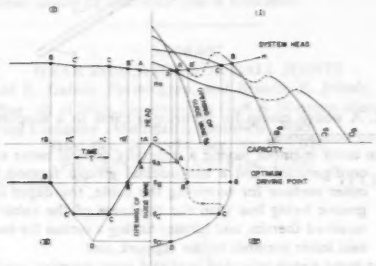
Masayasu Okada, and Hisao Inoue, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 11, 1974, Ser. No. 531,700

Claims priority, application Japan, Dec. 12, 1973, 48-137712

Int. Cl.² F01D *17/00;* **F03B** *15/20*

U.S. Cl. 415—1 **5 Claims**



1. A method of starting pump operation for a rotary machine that has adjustable guide vanes circumferencially arranged around a runner and a range of guide vane openings wherein there is discontinuity in head-capacity curves for a system head, which comprises the steps of: opening the adjustable guide vanes to a predetermined opening position beyond an optimum opening position where the pump operates under an optimum driving condition without reverse flow in the runner so that no reverse flow in the runner appears, and thereafter closing the adjustable guide vanes to (a reclosed position) said optimum opening position.

3,960,464

IMPROVEMENTS IN AND RELATING TO FANS

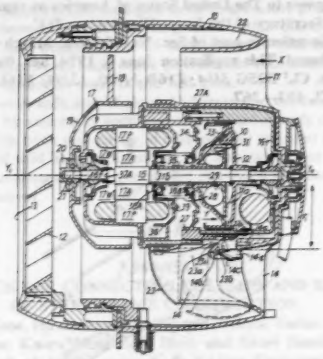
John Kenneth Downing, Cuckfield, England, assignor to Vent Axia Limited, Crawley, England

Filed Mar. 25, 1975, Ser. No. 561,983

Int. Cl.² F01D *17/06*

U.S. Cl. 415—146 **4 Claims**

1. An axial fan comprising a housing with a drive assembly positioned therein to define therewith an annular air passage, said drive assembly including a shaft co-axially arranged with respect to said air passage and a prime mover for rotating said shaft, said shaft being adapted to drive an air impeller, shutter means positioned within said air passage an carried by said drive assembly for pivotal movement with respect thereto, said shutter means including shutter plates having their pivotal axis tangential to a common circle lying in a plane substantially normal to the axis of said shaft with said circle having its center substantially coincident with the axis of said shaft, said shutter plates being movable by shutter operating means re-



sponsive to rotation of the shaft to move the shutter means to a position that opens said air passage when the impeller is rotating and to a position that closes said air passage when the impeller is not rotating.

3,960,465

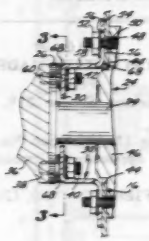
AUTOMOTIVE FAN CLUTCH LOCK

Howard A. Robison, 3429 Lewis Ave., Long Beach, Calif. 90807

Filed Dec. 19, 1974, Ser. No. 534,464

Int. Cl.² F04D *29/32*

U.S. Cl. 416—169 R **11 Claims**



1. In an automotive cooling fan and hub assembly wherein said fan is coupled to its drive shaft by clutch means including a fan drive shaft bearing a flange at one end with cooperative screw fasteners for securing said shaft in driven relationship to an engine; a clutch housing on the opposite end of said shaft and clutch means mounted therein for providing a modulated interconnection between said shaft and said fan; a cooling fan comprising a spider plate having a central aperture receiving said clutch housing and dependent fan plates carried on the clutch housing and secured thereto by screw fasteners; the improvement comprising:

mechanical lock means detachably secured to one member of said shaft flange and spider plate members and bearing slot means for detachable engagement with said screw fasteners carried on said one member;

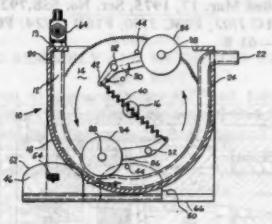
arms means dependent on said base and extending into engagement with the other member of said shaft flange and spider plate members, and interlock means carried on said arm for securing said arm to said other member.

3,960,466

DOUCHE-ENEMA PUMP

Edward J. Taylor, 201 Pecan Grove Court, San Jose, Calif. 95123

Filed Feb. 10, 1975, Ser. No. 548,676
Int. Cl.² F04B 21/00, 43/12
U.S. Cl. 417—234 6 Claims



1. A peristaltic action pump useful for douche and enema purposes and capable of delivering a uniform flow of liquid, comprising:

a flexible tube affixed in a hemicircular shape and having a fluid input port at one end thereof and a fluid exit port at the other end thereof;

a rotatable member adjacent said tube and generally parallel to the plane of said hemicircle, said rotatable member being rotatable about an axis in line with the axis of said hemicircle;

means coupled with said rotatable member for rotatingly driving it;

a pair of levers pivotally mounted intermediate thereof to said member, each at an equal and non-zero distance from the rotational axis of said member, a line from the mounting of one of said pair of levers to the mounting of the other of said pair of levers passing through said rotational axis of said member;

a pair of rollers, one of said rollers being pivotally attached to one of the ends of each of said levers, at least one of said pair of rollers including a shaft extending from the pivotal axis thereof and beyond said tube, said rollers extending sufficiently from said one end of said lever to press upon and temporarily deform said flexible tube, a line from the attachment of one of said pair of rollers to the attachment of the other of said pair of rollers passing generally through said rotational axis of said member;

a pair of pins, said pins being upraised from said rotatable members sufficiently to stop said levers from rotating about their pivotal mounting beyond said pins, said pins being further removed from the rotational axis of said member then are said levers, said pins being located generally intermediate the pivotal mounting of said levers and the rollers mounted to the one end of each of said levers;

spring means between the other ends of said pair of levers biasing said other ends of said pair of levers towards one another, a line from said other end of one of said levers to said other end of the other of said levers passing generally through said rotational axis;

a cam fixable in place adjacent said tube on an opposite side of said tube from said rotatable member, said shaft of each of said rollers extending sufficiently so as to ride upon said cam when fixed in place, said cam serving to keep one of said rollers from pressing upon and temporarily deforming said flexible tube during a portion of said rollers rotation about the rotational axis of said member whereby a pulsating flow of fluid can be selected by fixing said cam in place;

means for fixing said cam in place adjacent said tube; and

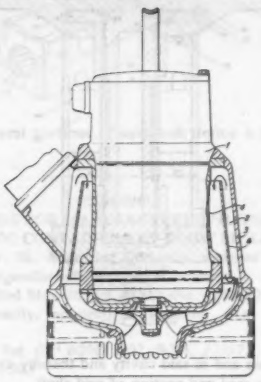
means for fixing said cam out of place away from said shaft.

3,960,467

COOLING DEVICE FOR A PUMP MOTOR

Miklos Zsuppan, Ekero, Sweden, assignor to International Standard Electric Corporation, New York, N.Y.

Continuation of Ser. No. 338,980, March 7, 1973, abandoned.
This application Sept. 16, 1974, Ser. No. 506,511
Int. Cl.² F04B 39/06
U.S. Cl. 417—366 5 Claims



1. A cooling device for an electric pump motor to insure continued cooling when a liquid medium being pumped is exhausted comprising a cooling jacket at least partially surrounding an electric motor, said jacket providing a chamber and an outlet portion through which a liquid medium being pumped is forced to flow through action of a pump impeller coupled to the motor, and an open ended partition wall encircling the motor and dividing the chamber into two open-ended chamber parts formed as concentric inner and outer chamber parts, said pump impeller being positioned relative to said chamber parts to force air to circulate through the two chamber parts when the liquid medium is exhausted, whereby the air circulates to carry heat from hot portions of the jacket to be dissipated through cooler portions of the jacket, said pump impeller forcing air successively through the outer chamber part and the inner chamber part to carry heat from the electric motor to be absorbed by the cooling jacket when said outlet portion is effectively closed.

3,960,468

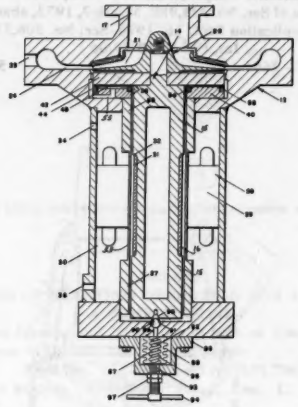
FLUID LUBRICATED BEARING ASSEMBLY

Henry A. Boorse, Leonia, N.J.; Gilbert F. Boeker, and John R. Menke, both of New York, N.Y., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed July 16, 1946, Ser. No. 683,871
Int. Cl.² F04B 17/00
U.S. Cl. 417—424 13 Claims

1. A support for a loaded rotatable shaft comprising in combination a housing having a fluid-tight cavity encasing an end portion of said shaft, a thrust bearing near the open end of said cavity for supporting the axial thrust of said shaft, said thrust bearing comprising a thrust plate mounted in said housing and a thrust collar mounted on said shaft, said thrust plate having a central opening the peripheral portion of which is hermetically sealed to said housing at the open end of said cavity, and means for supplying a fluid lubricant to said thrust bearing, said thrust bearing having a lubricant-conducting path connecting said lubricant supplying means with the space between said thrust plate and collar intermediate the peripheries thereof, the surfaces of said plate and collar being constructed and arranged to inhibit radical flow of lubricant and,

on rotation of said thrust collar, to draw lubricant through said path between the bearing surfaces and to increase the pressure



therebetween and in said cavity and thereby exert a supporting force on said end portion of said shaft.

3,960,469

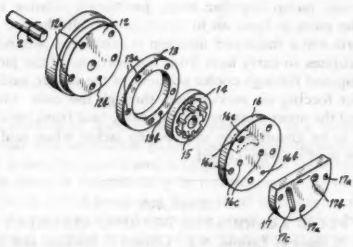
REVERSIBLE PUMP

Herbert E. Lindtveit, Wheaton, Ill., assignor to Sid Harvey, Inc., Valley Stream, N.Y.

Filed Oct. 23, 1975, Ser. No. 624,760

Int. Cl.² F01C *13/00, 21/12;* **F04C** *15/02*

U.S. Cl. 418—39 **6 Claims**



1. A rotary pump, comprising:

a. a shaft adapted to be driven in either direction;

b. a reversible pump rotor driven by the shaft;

c. a fixed member facing the side of the rotor opposite the shaft and having first and second reversible flow passages extending therethrough and aligned with the points of intake and discharge from the rotor, said points being reversed as to function when the direction of rotation of the rotor is reversed, and an outlet port opening in the face of the fixed member opposite the rotor;

d. a reversible plate having an inlet port extending therethrough, a recess in one surface adapted, when that surface is facing the fixed member, to provide fluid communication between one of said first and second reversible flow passages and the outlet port, and a recess in the opposite surface adapted, when the opposite surface is facing the fixed member, to provide fluid communication between the other of said first and second reversible flow passages and the outlet port; and

e. means holding said reversible plate against the fixed member, said pump being adaptable to maintain the same direction of flow through its inlet and outlet ports when the direction of rotation of the rotor is reversed, by removing the holding means and the reversible plate, turning the plate over and replacing the holding means.

3,960,470

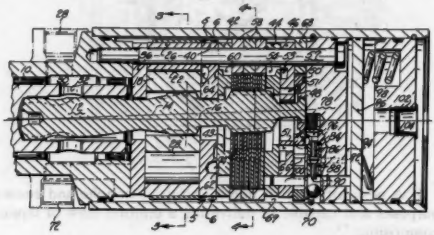
HYDRAULIC MOTOR BRAKE

Mark Russell Kinder, Lafayette, Ind., assignor to TRW Inc., Cleveland, Ohio

Filed Mar. 17, 1975, Ser. No. 558,792

Int. Cl.² F01C *1/02;* **F03C** *3/00;* **F16D** *65/24;* **F01C** *13/00*

U.S. Cl. 418—61 B **13 Claims**



1. A hydraulic device comprising a first shaft rotatable about its longitudinal axis, a second shaft rotatable about its longitudinal axis, means for joining said second shaft to said first shaft for rotation therewith, said second shaft being oriented with its longitudinal axis angularly disposed relative to the longitudinal axis of said first shaft, so that said first and second shafts are adapted for joint rotation and said second shaft is adapted for both orbital and rotational motion, a hydraulic motor for rotating said shafts, means for applying a braking torque to said first and second shafts tending to retard motion of said first and second shafts, said braking means being separate from said hydraulic motor comprising one or more braking members fixedly secured to said second shaft for rotational and orbital motion therewith and means for frictionally resisting the orbital and rotational movement of said braking members.

3,960,471

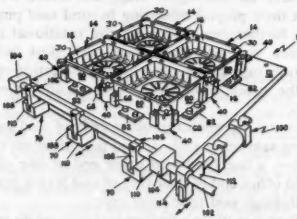
CONTAINER MOLDING APPARATUS

Roger L. Medendorp, Grand Rapids, Mich., assignor to Kirkhof Manufacturing Corporation, Grand Rapids, Mich.

Filed Dec. 23, 1974, Ser. No. 535,179

Int. Cl.² B29C *17/03*

U.S. Cl. 425—388 **23 Claims**



1. Molding apparatus for vacuum forming an article from sheet material comprising a base; at least one mold mounted on said base, said mold having upstanding side walls and a bottom defining a mold cavity, means defining an aperture in one of said side walls, a vacuum chamber, and a plurality of fluid passageways connecting said vacuum chamber with said mold cavity; said base including fluid passageways communicating with said vacuum chamber for evacuating said chamber and mold cavity when a sheet to be molded is laid across the

top of said mold; a molding projection; insertion means adjacent said aperture for inserting said projection through said aperture to form the sheet material therearound including plate means supporting said projection for moving said projection through said side wall, sealing means for sealing said aperture around said projection to prevent fluid flow through said aperture when said projection is inserted therein, and camming means for moving said plate means to insert and remove said projection from said aperture.

3,960,472

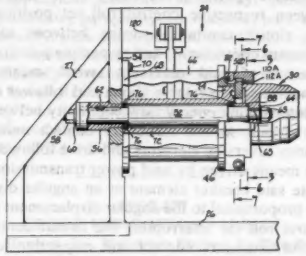
BELLING ASSEMBLY AND METHOD OF FORMING A BELL END

John Vincent O'Connor, Englewood, and Edmund Joseph Zolnick, Perry Park, Larkspur, both of Colo., assignors to Johns-Manville Corporation, Denver, Colo.

Division of Ser. No. 386,120, Aug. 6, 1973, abandoned. This application Oct. 3, 1974, Ser. No. 511,874

Int. Cl.² B29C *17/00*

U.S. Cl. 425—393 **7 Claims**



1. An assembly for use in forming an inner circumferential groove in a heat deformable pipe, said assembly comprising:

a. a core section having a longitudinal axis and a predetermined outer circumferential surface configuration;

b. a plurality of core segments located adjacent said core section;

c. means supporting said core segments for cooperative movement in a predetermined plane perpendicular to said axis, said segments being movable in said plane between an expanded position such that together said segments have an outer circumferential surface configuration which at all points is located outwardly from the outer surface configuration of said core section and a collapsed position inwardly of said expanded position, said supporting means supporting predetermined ones of said segments for pivotal movement about respective axes parallel with said longitudinal axis during movement of said segments between said expanded and collapsed positions, and supporting predetermined ones of said segments for straight line movement in said predetermined plane; and

d. means for moving said core segments between said expanded position and said collapsed position.

3,960,473

DIE STRUCTURE FOR FORMING A SERRATED ROD

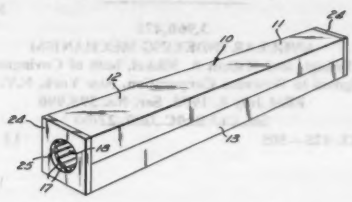
Thomas Harris, Chesterland, Ohio, assignor to The Glastic Corporation, South Euclid, Ohio

Filed Feb. 6, 1975, Ser. No. 547,550

Int. Cl.² B29C *23/00*

U.S. Cl. 425—467 **4 Claims**

1. A pultrusion die for forming serrated, fiber-reinforced plastic articles, comprising a die block having a cylindrical cavity defined by a wall extending therethrough, a plurality of cylindrical rods arranged about the cavity wall with substantially all of said rods being in contact with circumferentially adjacent rods so that said rods lock each other in place against inward radial displacement and are fixed in place so that the



inner peripheral portions of said rods define a serrated die cavity.

3,960,474

APPARATUS FOR MANUFACTURING REINFORCED PLASTIC CONTAINERS BY BLOW MOLDING

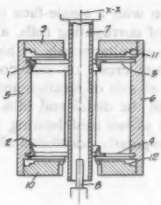
Reiner Kader, St. Augustin, Germany, assignor to Mauser Kommanditgesellschaft, Cologne, Germany

Filed May 20, 1974, Ser. No. 471,642

Claims priority, application Germany, May 24, 1973, 2326477

Int. Cl.² B29D *3/02*; B29C *17/07*

U.S. Cl. 425—503 **6 Claims**



1. In a molding apparatus for blow molding thermoplastic containers having their opposite ends reinforced by reinforcing hoops bonded to the outer peripheral end edges thereof, the improvement comprising:

a mold divided into two halves which are movable between an extended position wherein said mold halves are spaced from one another and a closed position wherein said mold halves engage one another to form a continuous, circumferential, interior surface;

each of said mold halves having an upper end and a lower end;

each of said mold halves having an upper groove in its interior surface adjacent to said upper end thereof and a lower groove in its interior surface adjacent to said lower end thereof;

said upper grooves in each of said mold halves being aligned with one another so as to form a continuous upper groove when said mold halves are in their closed position;

said lower grooves in said mold halves being aligned with one another so as to form a continuous lower groove when said mold halves are in their closed position;

said continuous upper and lower grooves being adapted to receive and retain the outer peripheral edges of reinforcing hoops;

an upper end plate half overlying said upper end of each of said mold halves; and a lower end plate half underlying said lower end of each of said mold halves;

said end plate halves being movable with said mold halves between their said extended position and their said closed position;

said end plates being movable toward one another when said mold halves are in their said closed position to en-

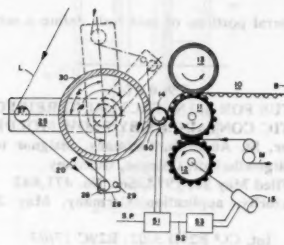
gage and retain portions of upper and lower reinforcing hoops in place.

3,960,475

ANGULAR INDEXING MECHANISM

John DeLigt, and Willem A. Nikkel, both of Covington, Va., assignors to Westvaco Corporation, New York, N.Y.

Filed July 8, 1975, Ser. No. 593,990
Int. Cl.² B29C 3/00, 27/00
U.S. Cl. 425—505 12 Claims



1. In combination with a single-face corrugating machine comprising a pair of corrugating rolls, a web heating roll, a fusion roll running simultaneously in nip relation with said heating roll and flute crests on said corrugating rolls, said heating roll having an axis of rotation and a wrap control roll rotatably secured to the distal end of a pair of radius arms rotatably mounted about said heating roll axis, said wrap control roll being angularly positioned about said heating roll axis by rotational power transmission means, the improvement comprising:

A. Electric motor means for driving said transmission means; and

B. Motor control means for regulating the operation of said motor means to set said wrap control roll at a desired one of a predetermined number of arcuately spaced set positions about said heating roll axis over an adjustment arc of less than 360°, said motor control means comprising a rotary selector switch means, drive follower means, and polarity reversing switch means for controlling the flow of electric drive energy from a supply source to said motor means, said rotary selector switch means having a number of first stationary contacts corresponding to the predetermined number of control roll set positions and a rotary contact means for selectively connecting said energy source to one of said first stationary contacts, said drive follower means having a number of second stationary contact units corresponding to said number of control roll set positions, said second stationary contact units being positioned about a follower means axis by an arcuate spacing proportional to the arcuate spacing between respective control roll set positions, energy flow circuit continuity means between said second stationary contact units and respective polarity reversing elements of said reversing switch means, breaker element means rotatable about said follower means axis for interrupting energy flow continuity between at least one of said second stationary contact units and said polarity reversing elements and drive follower transmission means driven by said power transmission means to rotate said breaker element at an angular displacement rate proportional to the angular displacement rate of said control roll for interrupting the circuit continuity of a second stationary contact unit respective to the positional alignment of said control roll with a respective one of said predetermined set positions.

3,960,476
LYOPHILIZED AND SPRAY DRIED DYES

Giuliana Ghilardi, 52, Rue Michel-Ange, Paris; Pierre Boré, 197. Avenue Daniel Perdrige, 93 Montfermeil, and Jean-Francois Grollier, 19, Rue de Dantzig, Paris, all of France

Continuation of Ser. No. 120,353, March 2, 1971, abandoned. This application Apr. 15, 1974, Ser. No. 461,261
Claims priority, application Luxemburg, Oct. 19, 1970, 60449; Feb. 15, 1971, 61890
Int. Cl.² A61K 7/12, 7/13
U.S. Cl. 8—10.1 17 Claims

1. A process for producing a lyophilized dyestuff comprising reacting with a molar excess of hydrogen peroxide an oxidation base in an aqueous alkaline solution open to ambient atmosphere and having a pH ranging from 8 to 13 at a temperature between about 15°–30°C for a period of about 5 minutes to 30 hours and lyophilizing said raction mixture, said oxidation base being selected from the group consisting of paratoluylene diamine, paraphenylene diamine, N,N-dimethyl paraphenylene diamine, chloroparaphenylene diamine, 2-methoxy-5-methyl paraphenylene diamine, 2,6-dimethyl-3methoxy paraphenylene diamine, tetramethyl paraphenylene diamine, 2-methoxy paraphenylene diamine, para aminophenol, 2,6-dimethyl para aminophenol, 2,4-diamino anisole, 2-methyl para aminophenol, the hydrochlorides thereof, and mixtures thereof, wherein lyophilizing said reaction mixture comprises freezing said reaction mixture at a temperature of about −200°C to −60°C and subliming said frozen mixture at a temperature of about −50°C to −30°C at a pressure of about 0.01 mm Hg to 0.1 mm Hg.

3,960,477
CROSSDYED COTTON FABRICS

Robert J. Harper, Jr., Metairie; Eugene J. Blanchard, New Orleans; John T. Lofton, and Gloria A. Gautreaux, both of Metairie, all of La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Jan. 11, 1974, Ser. No. 432,800
Int. Cl.² D06P 1/38, 3/60, 5/12
U.S. Cl. 8—15 2 Claims

1. A process for producing crossdyed cotton fabrics comprising:

a. crosslinking a cotton yarn with a hydrolyzable crosslinking agent selected from the group consisting of dimethylolethyleneurea and dimethylolpropyleneurea thereby imparting dye resistance to said yarn;
b. combining said crosslinked yarn with an uncrosslinked yarn to form a fabric;
c. dyeing said fabric with a first reactive cotton dye;
d. hydrolyzing the said crosslinking agent in said crosslinked yarn, rendering said yarn dye reactive; and
e. dyeing said fabric with a second reactive cotton dye.

3,960,478
SYNTHETIC CHINCHILLA FUR PRODUCTION BY REVERSE SIDE APPLICATION OF DYE SOLUTION

Georges Pouille, 2, Rue de Linselles, 59 Halluin, France

Division of Ser. No. 319,240, Dec. 29, 1972, Pat. No. 3,915,629. This application May 15, 1975, Ser. No. 577,670
The portion of the term of this patent subsequent to Oct. 28, 1992, has been disclaimed.
Int. Cl.² D06P 5/00
U.S. Cl. 8—14 1 Claim

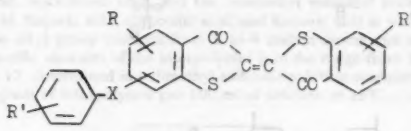
1. In a process for the production of synthetic fur imitation of chinchilla fur, wherein a long pile is provided upon a surface of a fabric backing, the improvement which comprises dyeing the pile by forcing a dye over only limited areas of the fabric backing through the latter at a pressure of the order of several tens of bars from the side of the fabric backing opposite that from which the pile extends and sufficient to effect diffusion of the dye along the pile over only a limited length thereof.

3,960,479
COLORING OF ORGANIC MATERIALS WITH ASYMMETRIC THIOINDIGOID COMPOUNDS

Michihiro Tsujimoto, Tachikawa; Tsutomu Nishizawa, Kamakura, and Ichiro Okubo, Hachioji, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Filed Apr. 30, 1975, Ser. No. 573,102
Claims priority, application Japan, May 9, 1974, 49-50686
Int. Cl.² D06P 1/22
U.S. Cl. 8—36 8 Claims

1. A method for dyeing synthetic or semi-synthetic polymeric fibres with an asymmetric thioindigoid compound having the formula:



wherein
R is a hydrogen atom or lower alkyl group;
R′ is a member selected from the group consisting of
1. a hydrogen atom,
2. halogen atoms,
3. lower alkyl groups,
4. lower alkoxy groups,
5. a sulfonamide group the amide group of which may be substituted with a member selected from the group consisting of
i. lower alkyl groups which may be substituted with
a. a hydroxyl group,
b. lower alkoxy group or
c. cyano group,
ii. a cyclohexyl group,
iii. aralkyl groups and
iv. a phenyl group which may be substituted with
a. a lower alkyl group,
b. chlorine atom or
c. lower alkoxy group, and
6. aryl sulfonate groups the aryl group of which may be substituted with
i. a halogen atom,
ii. lower alkyl group or
iii. lower alkoxy group;
R″ is a hydrogen atom or methyl group; and
X is an oxygen atom or sulfur atom.

3,960,480

BISAZO DYESTUFFS OF THE 2,6-DIAMINOPYRIDINE SERIES

Ernst Heinrich; Konrad Mix, both of Frankfurt am Main, and Joachim Ribka, Offenbach, (Main)-Burgel, all of Germany, assignors to Cassella Farbwerke Mainkur Aktiengesellschaft, Germany

Division of Ser. No. 438,616, Feb. 1, 1974. This application Oct. 30, 1974, Ser. No. 519,111

Claims priority, application Germany, Feb. 10, 1973, 2306673

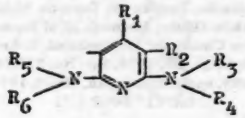
Int. Cl.² C09B 2/00

U.S. Cl. 8—41 R 3 Claims

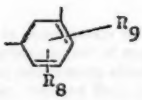
1. In the process of dyeing or printing synthetic materials with a pigment, the improvement which comprises employing a bisazo dyestuff of the formula

Q — N = N — A — N = N — Q_1,

wherein each of Q and Q_1 is a radical of the formula



A is a radical of the formulae



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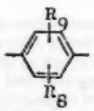

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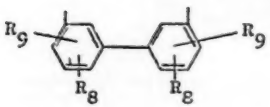

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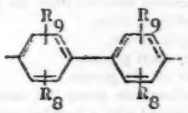

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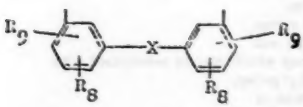

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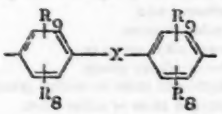

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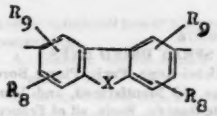

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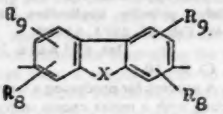

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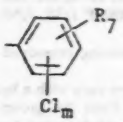
or

;

R_1 is alkyl having 1 to 3 carbon atoms; R_2 is cyano or —$CONH_2$; each of R_3 and R_4 is hydrogen, methyl, —C_2H_4OH, —$CH_2CH(OH)CH_3$, —$CH_2CH_2CH_2OH$, —$C_2H_4CONH_2$, benzyl, phenethyl, cyclopentyl, cyclohexyl or



each of R_5 and R_6 is hydrogen, alkyl having 1 to 3 carbon atoms, —C_2H_4OH, —$CH_2CH(OH)CH_3$ or —$CH_2CH_2CH_2OH$; R_7 is hydrogen, methyl, methoxy, —$NHCOCH_3$, —C_2H_4CN or —$NHCOC_2H_5$; m is 0, 1, 2, or 3; each of R_8 and R_9 is hydrogen, halogen, nitro, methyl or methoxy; X is —O—, —S—,

or —SO_2—0 and X_1 is —O—, —S— or —NH—.

3,960,481

PROCESS FOR TANNING LEATHER

Gerald M. Cote, Holland, Pa., assignor to Thermanil Chemical Company, Incorporated, Croyden, Pa.

Division of Ser. No. 292,710, Sept. 27, 1972, Pat. No. 3,901,929. This application Apr. 18, 1975, Ser. No. 569,247

Int. Cl.² C14C 3/08, 3/06

U.S. Cl. 8—94.26 12 Claims

1. In a process for the chrome tanning of leather the improvement comprising adding to the leather while it is in the tanning wheel a tanning agent comprising an organic salt of a phosphorated ethoxylated saturated fatty acid ester, the saturated fatty acid having from 12 to 20 carbon atoms and said

salt being the neutralization product of said ester with an organic base.

3,960,482

DURABLE PRESS PROCESS EMPLOYING HIGH MOISTURE CONTENT FABRICS

George Louis Payet, Cincinnati, Ohio, assignor to The Strike Corporation, Cincinnati, Ohio

Filed July 5, 1974, Ser. No. 486,168
Int. Cl.² B05D *3/04*
U.S. Cl. 8—116.4 20 Claims

1. A durable-press process for cellulosic fiber-containing fabrics, comprising, impregnating a cellulosic fiber-containing fabric with an aqueous solution containing a water soluble normally solid catalyst selected from the group consisting of acids, acid salts and mixtures thereof which are capable of catalyzing the cross-linking reaction between formaldehyde and cellulose, to provide from 0.1 to about 10.0 percent of said catalyst in said fabric on a dry weight basis, then exposing said impregnated fabric, while said fabric has a moisture content of about 20 percent by weight where the cellulose fibers are substantially completely swollen, to formaldehyde vapors and curing under conditions at which formaldehyde reacts with cellulose in the presence of the catalyst to improve the wrinkle resistance of the fabric.

3,960,483

DURABLE PRESS PROCESS EMPLOYING ALKYLSULFONIC OR SULFURIC ACID

George Louis Payet, Cincinnati, Ohio, assignor to The Strike Corporation, Cincinnati, Ohio

Continuation-in-part of Ser. No. 486,168, July 5, 1974. This application Nov. 18, 1974, Ser. No. 524,770
Int. Cl.² B05D *3/04*
U.S. Cl. 8—116.4 10 Claims

1. A durable-press process for cellulosic fiber-containing fabrics, comprising: impregnating a cellulosic fiber-containing fabric with an aqueous solution of an alkylsulfonic acid or a low concentration of sulfuric acid which is capable of catalyzing the cross-linking reaction between formaldehyde and cellulose, to provide from 0.1 to about 0.5 percent of said catalyst in said fabric on a dry weight basis, then exposing said impregnated fabric, while said fabric has a moisture content of above 20 percent by weight where the cellulose fibers are substantially completely swollen, to formaldehyde vapors and curing under conditions at which formaldehyde reacts with cellulose in the presence of the catalyst to improve the wrinkle resistance of the fabric.

3,960,484

PROCESS AND APPARATUS FOR IMPROVING THE FIBER STRUCTURE OF TEXTILE MATERIAL CONTAINING CELLULOSE FIBERS

Erwin Leimbacher, Wattwil; Walter Marte, Ulisbach, and Ferdinand Buchele, Wattwil, all of Switzerland, assignors to Herberlein Textildruck AG, Wattwil, Switzerland

Filed Feb. 12, 1974, Ser. No. 441,839
Claims priority, application Switzerland, Feb. 14, 1973, 2170/73
Int. Cl.² D06M *1/02*
U.S. Cl. 8—125 20 Claims

1. Process for improving the fiber structure of textile materials containing cellulose fibers in which the textile material is impregnated with an alkali hydroxide solution heated to a temperature of at least 50°C for a period of between 4 and 10 seconds, thereupon cooled to a temperature less than 25°C, stretched and washed, said alkali hydroxide solution being selected from the group consisting of a sodium hydroxide solution of a concentration between about 15° and 30° Be and a lithium hydroxide solution of a concentration of between approximately 5 and 10 percent.

3,960,485

PROCESS FOR RECOVERY AND REUSE OF TEXTILE SIZE

Joel Fantl, Springfield, and Joseph G. Martins, Ludlow, both of Mass., assignors to Monsanto Company, St. Louis, Mo.

Filed June 19, 1974, Ser. No. 480,670
Int. Cl.² B01D *23/00*; D06L *1/14*, *1/16*
U.S. Cl. 8—138 31 Claims

1. A process for recovery of a warp size from a woven cloth sized with an interpolymer or an alkali metal salt of an interpolymer of a vinyl ester and an α, β-unsaturated acid which comprises:

A. desizing the cloth by contacting it with an aqueous scouring solvent containing from 0 to 400 milliequivalents of an alkali metal hydroxide or carbonate per 100 parts by weight of interpolymer at a temperature of 45° to 100°C. to yield a desize liquor of pH in the range of 6 to 10, containing from 0.70 to 7.5 parts by weight of the interpolymer per 100 parts by weight of the desize liquor,

B. adding alkali metal ion to the desize liquor to provide a total concentration from 125 to 600 milliequivalents per 100 g. of interpolymer,

C. adding an acid of pK_a at least 4.8 and a water solubility of at least 20 parts by weight per hundred parts of water, to the desize liquor at a temperature in the range of 40°–90°C. to reduce the pH of the desize liquor to from 1 to 3, thereby precipitating the interpolymer, and

D. isolating the precipitated interpolymer from the supernatant solution,

wherein the interpolymer comprises 90 to 97 parts by weight of a vinyl ester containing 4 to 7 carbon atoms and 3 to 10 parts by weight of an α,β-unsaturated acid selected from the group consisting of acrylic acid, methacrylic acid, crotonic acid, isocrotonic acid, and the monoalkyl esters of maleic acid, fumaric acid, citraconic acid, and itaconic acid in which the alkyl group contains from 1 to 4 carbon atoms and the specific viscosity of the interpolymer is in the range from 1.2 to 12, determined in a dimethyl sulfoxide solution containing 1 gram of interpolymer per 100 ml of solution at 25°C.

3,960,486

POWDERED, HIGHLY CONCENTRATED AND STABLY DISPERSIBLE DYE FORMULATIONS

Ewald Daubach, Ludwigshafen; Heinz Saukel, Friedelsheim, and Leonhard Von Rambach, Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Sept. 16, 1974, Ser. No. 506,560
Claims priority, application Germany, Sept. 27, 1973, 2348518
Int. Cl.² D06P *1/68*
U.S. Cl. 8—79 8 Claims

1. A powdered, highly concentrated and stably dispersible dye formulation which is practically devoid of dye agglomerate and which consists essentially of:

A. at least one water-insoluble dye;

B. at least one anion-active dispersing agent in an amount sufficient to disperse said dye in water; and

C. as a stabilizing agent from 2 to 30% by weight, with reference to said dye, of an oxyalkylation product which is (C.1) a reaction product of

a. a saturated fatty alcohol or unsaturated fatty alcohol, each of 6 to 20 carbon atoms, or a mixture thereof;

b. an alkylphenol of 4 to 12 carbon atoms in the alkyl;

c. a saturated fatty amine or unsaturated fatty amine, each of 14 to 20 carbon atoms, or a mixture thereof;

d. castor oil or hydrogenated castor oil;

e. a saturated fatty acid or unsaturated fatty acid, each of 14 to 20 carbon atoms, or a mixture thereof; or

f. a natural resin acid, with from 2 to 80 moles of ethylene oxide per mole of hydroxyl or amino groups reactive with ethylene oxide;

(C.2) a reaction product of

g. an alkylenediamine of 2 to 5 carbon atoms with from 25 to 120 moles of propylene oxide and ethylene oxide per mole of amino groups, at least 20 moles of ethylene oxide being used per mole of amino groups;

(C.3) a polyethylene oxide of a molecular weight of from 200 to 1,000; or

(C.4) a mixture of two or more of the oxyalkylation products designated above as (C.1), (C.2) and (C.3).

3,960,487

LIQUID-TREATING OF FILAMENTARY MATERIALS

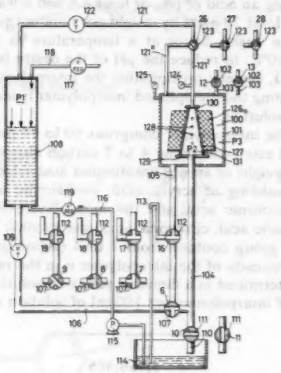
Vilem Stritzko, Strengelbach, Switzerland, assignor to Bleiche A.G., Zofingen, Switzerland

Filed Jan. 9, 1975, Ser. No. 539,738

Claims priority, application Switzerland, Jan. 16, 1974, 561/74

Int. Cl.² D06B 5/18

U.S. Cl. 8—155.1 **15 Claims**



1. A method of liquid-treating filamentary materials, such as threads, yarn and textiles, comprising the steps of confining a hollow package of filamentary material within a vessel so that the package subdivides the interior of the vessel into an inner and a separate outer chamber which communicate only through the thickness of the filamentary material; admitting a foamable treating liquid in unfoamed state into only one of said chambers; pressing an amount of said liquid from said one chamber into the filamentary material sufficient to wet the filamentary material without substantially any of said liquid entering the other chamber; discharging the residual, unfoamed liquid from said one chamber; and forcing a pressurized gaseous fluid through said package from one chamber into the other chamber to thereby foam the liquid within the filamentary material and evenly distribute it throughout said package.

3,960,488

METHOD AND APPARATUS FOR QUANTITATIVE SURFACE INHIBITION TEST

Ivar Giaever, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Apr. 1, 1974, Ser. No. 457,091

Int. Cl.² G01N 33/16

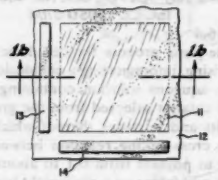
U.S. Cl. 23—230 B **40 Claims**

1. Apparatus for determining the concentration of immunologically reactive biological particles in a test solution, comprising in combination:

a solid substrate member having a metallized major surface,

a layer of first immunologically reactive biological particles adsorbed over at least a portion of said metallized surface,

means in substantially complete contact with the outer surface of said layer of first biological particles for holding a quantity of moisture in the immobile state whereby the moisture can function as a diffusing medium,



means for placing a first straight longitudinally-extending deposit of solution into contact with said moisture along the length of said first deposit, and

means for placing a second straight longitudinally-extending deposit of solution into contact with said moisture along the length of said second deposit, said first and second deposits extending in a particular orientation relative to each other whereby the solutions of said first and second depposits will diffuse through said moisture toward each other and toward said layer of first biological particles.

3,960,489

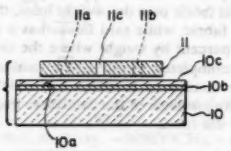
METHOD AND APPARATUS FOR DETERMINATION OF CONCENTRATION OF IMMUNOLOGICALLY REACTIVE BIOLOGICAL PARTICLES

Ivar Giaever, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Apr. 1, 1974, Ser. No. 457,092

Int. Cl.² G01N 33/16

U.S. Cl. 23—230 B **36 Claims**



1. Apparatus for determining the presence or absence of select biological particles in a biological sample and the concentration of said select biological particles, if present, comprising in combination

a solid substrate member having metallized surface area,

a first monomolecular layer of biological particles immunologically specific to said select biological particles adsorbed on said metallized surface area and

means for locating a stationary region of an aqueous liquid on and in contact with said first monomolecular layer.

3,960,490

METHOD AND APPARATUS FOR DETECTING IMMUNOLOGIC REACTIONS BY DIFFUSION IN GEL

Ivar Giaever, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Apr. 1, 1974, Ser. No. 457,093

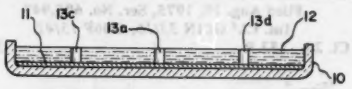
Int. Cl.² G01N 33/16, 31/02; C12K 1/00

U.S. Cl. 23—230 B **29 Claims**

1. Apparatus for determining the presence or absence of

select biological particles in a biological sample, comprising in combination

a solid substrate member having a metallized surface area thereon and



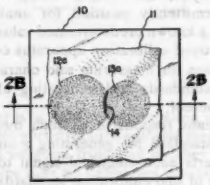
a gel layer on and in direct contact with said metallized surface area, said gel layer having a plurality of holes therethrough exposing metallized surface area at the bottom of said holes, said gel layer being substantially free of biological particles.

3,960,491

METHOD AND APPARATUS FOR DETECTING IMMUNOLOGICALLY REACTIVE BIOLOGICAL PARTICLES

Ivar Giaever, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Apr. 1, 1974, Ser. No. 457,094
Int. Cl.² G01N *33/16*
U.S. Cl. 23—230 B **23 Claims**



1. Apparatus for determining the presence or absence of select biological particles in a biological sample, comprising in combination

a solid substrate member having a metallized surface area thereon and

means for locating a layer of immobilized liquid on and in direct contact with said metallized surface area, said locating means being a porous membrane of a material selected from the group consisting of cellulose and cellulose derivatives, said porous membrane containing said liquid.

3,960,492

METHOD FOR DETERMINING AN INDEX OF BINDING PROTEIN CONTENT OF BLOOD

Walter DiGiulio, Grosse Pointe Woods, Mich., assignor to Nuclear Diagnostics, Inc., Troy, Mich.

Filed May 31, 1974, Ser. No. 475,213
Int. Cl.² G01N *33/16*
U.S. Cl. 23—230 B **24 Claims**

1. A method for determining an index of binding proteins in a blood sample comprising the steps of:

1. Forming a mixture of a) the blood sample, having ligand binding sites, b) a known quantity of a radioactive ligand and c) a known amount of nonradioactive ligand wherein the total amount of the ligand is in excess of the ligand binding sites available in the blood sample;
2. Contacting the mixture with a quantity of a binder having a preferential affinity for the ligand; and
3. Thereafter, determining the radioactive distribution of the ligand.

3,960,493

METHOD OF MEASURING THE FAT AND PROTEIN CONTENT IN FLUIDS

Donald C. Beitz, Ames, and Mitchell E. Phillips, West Des Moines, both of Iowa, assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Nov. 18, 1974, Ser. No. 524,739
Int. Cl.² G01N *31/02, 33/06, 33/16*
U.S. Cl. 23—230 B **10 Claims**

1. A nephelometric method for the sequential determination of protein and fat in a biological fluid sample containing protein and fat comprising the steps of (1) adding to the sample a first reagent solution which is substantially anhydrous and is effective to dissolve the fat content of the sample and to substantially denature the protein therein to thereby provide a colloid protein dispersion, (2) taking a nephelometric reading of the colloidally dispersed protein in the sample, (3) adding to the sample prepared in step (1) a second solution comprised predominantly of water which precipitates the fat in the sample so as to form a colloidal fat dispersion and which dissolves the protein, and (4) taking a nephelometric reading of the colloidally dispersed fat.

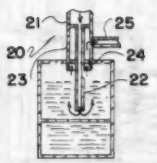
8. A reagent solution, useful for the nephelometric determination of protein in a milk sample, said solution containing para-toluene sulfonic acid, acetic anhydride, and acetic acid, the para-toluene sulfonic acid being present in an amount of less than about 1 gram per 100 milliliters of solution and the acetic anhydride being present in about 5–20 percent by volume, the balance of the solution consisting essentially of acetic acid.

3,960,494

COLORIMETRIC ODORANT LEVEL TEST IN NATURAL, SYNTHETIC AND L.P. GAS AND THE LIKE

Arun Verma, Regina, and Arthur R. Knight, Saskatoon, both of Canada, assignors to Saskatchewan Power Corporation, Regina, Canada

Filed Nov. 11, 1974, Ser. No. 522,331
Int. Cl.² B65D *25/08*; G01N *31/22, 33/22*
U.S. Cl. 23—232 R **7 Claims**



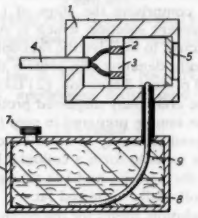
1. A method of measuring the quantity of mercaptan-based odorants in a gas stream comprising the steps of bubbling a sample of the gas through a first chemical reagent in a first compartment of a reagent carrying tube by piercing a membrane covering said first compartment, and then mixing the chemical reagent with at least one further chemical reagent in a second compartment of said tube and being separated from said first compartment by a further membrane spanning said tube, by piercing said second membrane, the mixing of said reagents producing a color in said mixture and then comparing the resulting color in said mixed reagents with a color shade standard.

3,960,495

DETECTION OF COMBUSTIBLE GASES

Anthony Desmond Shand Tantram, 50 Downs Way, Great Bookham, near Leatherhead, Surrey, England

Continuation-in-part of Ser. No. 330,454, Feb. 7, 1973, abandoned. This application Feb. 21, 1975, Ser. No. 551,849
Claims priority, application United Kingdom, Feb. 15, 1972, 7035/72; July 26, 1972, 35050/72
Int. Cl.² G01N 27/16, 31/10, 31/12
U.S. Cl. 23—232 E 7 Claims



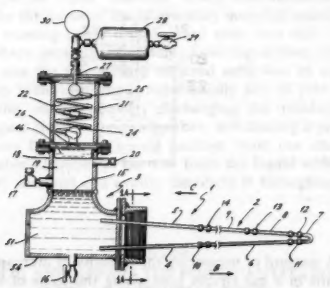
1. In a method of continuously monitoring an atmosphere to detect the presence of a combustible gas or vapour in the atmosphere comprising testing the atmosphere with a detector including a transducer which responds to the presence of the combustible gas or vapour in the atmosphere, the improvement comprising the steps of continuously supplying to the vicinity of the transducer a controlled known small amount of a known combustible gas or vapour to which the transducer responds so that the detector normally indicates the presence of at least the said controlled amount of combustible gas or vapour, said detector indicating malfunctioning of said transducer by not giving a reading for the known combustible gas or vapor.

3,960,496

CORROSION PROBE DEVICE FOR BOILER GASES

John R. Schieber, Holland, Pa., assignor to Betz Laboratories, Inc., Trevose, Pa.

Filed Oct. 30, 1975, Ser. No. 627,171
Int. Cl.² G01N 17/00
U.S. Cl. 23—253 C 28 Claims



1. A constant temperature cold-end corrosion probe device for the flue gas stream of a boiler, said device comprising:

constant temperature probe means for insertion into said flue gas stream, and

temperature maintaining means for maintaining the temperature of said probe means substantially constant,

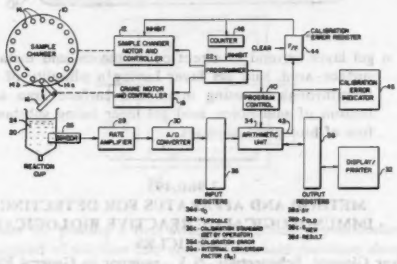
wherein said temperature maintaining means includes condenser means having a variable tube side heat transfer area.

3,960,497

CHEMICAL ANALYZER WITH AUTOMATIC CALIBRATION

William A. Acord, Claremont, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Aug. 19, 1975, Ser. No. 605,947
Int. Cl.² G01N 33/16; G06F 15/42
U.S. Cl. 23—253 R 3 Claims



1. Improved calibration apparatus for use in an automatic analyzer of the type which measures a characteristic of a plurality of samples and includes sample changer means adapted to advance said samples in sequential fashion into position for analysis, the sample changer means further adapted to intermittently position for analysis calibration standards having a known predetermined value of said characteristic, the improved calibration apparatus comprising:

measuring means for measuring said characteristic of said calibration standards and generating electrical signals indicative thereof,

conversion means responsive to each measurement of a calibration standard for generating a conversion factor which converts each electrical signal to said predetermined value of said calibration standards,

storage means for storing said conversion factor,

verification means for verifying the calibration of said analyzer upon each analysis of a calibration standard including means for comparing the conversion factor generated for the calibrated standard being measured with the stored conversion factor for the previously analyzed calibration standard and for generating a control signal if the compared conversion factors differ by more than a predetermined amount,

sample changer control means responsive to said control signal for halting advancement of the sample changer means to maintain the calibration standard being measured in position for remeasurement, and

means for energizing said measuring means to remeasure the calibration standard.

3,960,498

ELECTROCHEMICAL ANALYSIS SYSTEM

Jerrold Zindler, Boston, and Gustav H. Dreier, Acton, both of Mass., assignors to Instrumentation Laboratory, Inc., Lexington, Mass.

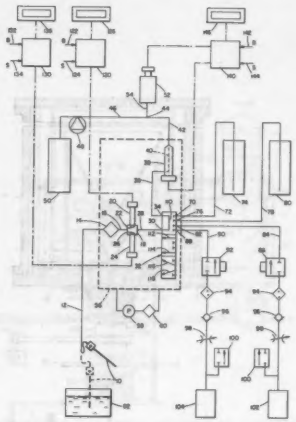
Filed Aug. 1, 1974, Ser. No. 493,786
Int. Cl.² E03B 11/00; F17D 1/00; G01N 27/26, 33/16
U.S. Cl. 23—253 R 17 Claims

1. An electrochemical analysis system comprising a plurality of flow through measuring chambers, a measuring electrode system connected in measuring relation to each said chamber,

system inlet port structure, conduit connecting said system inlet port structure to said chambers, calibrating fluid inlet port structure, and

a fluid control having a first (analysis) mode in which said measuring chambers are in fluid communication with the

system inlet port structure so that fluid from the same sample may be concurrently flowed into said measuring chambers for concurrent sensing by said measuring electrode systems, and a second mode in which one measuring chamber is in fluid communication with said calibrating fluid inlet port structure and said measuring chambers are in fluid isolation from one another so that the electrode systems may be calibrated concurrently and independently of one another.



3,960,499

BIOLOGICAL TEST APPARATUS

Fred K. White, Glen Ellyn, Ill., assignor to Miles Laboratories, Inc., Elkhart, Ind.

Filed Feb. 18, 1975, Ser. No. 550,603
Int. Cl.² B01R *5/00*
U.S. Cl. 23—253 R **8 Claims**

1. Biological test apparatus comprising an organoplastic support surface which has been treated to become hydrophilic and an aqueous gel in uniform close adherent contact with said hydrophilic surface.

3,960,500

GAS SAMPLING ANALYZING SYSTEM

David F. Ross, Euclid, and Robert E. Pocock, Highland Heights, both of Ohio, assignors to Bailey Meter Company, Wickliffe, Ohio

Filed Jan. 9, 1975, Ser. No. 539,764
Int. Cl.² B01K *1/00*; G01M *27/26*
U.S. Cl. 23—254 E **14 Claims**

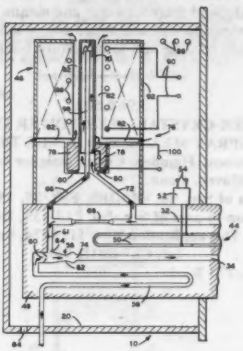
1. A gas sampling analyzing system for analyzing gases within a duct comprising:

probe means, mountable within the duct, to draw a sample of the gases therein;

an analyzer assembly mounted outside of the duct and being connected to said probe means to analyze said sample;

an exhaust line connected to said analyzer assembly for exhausting the analyzed gas from said analyzer assembly back to the duct; and

aspirator means mounted externally of the duct for inducing a substantially constant flow of sample gas from the duct



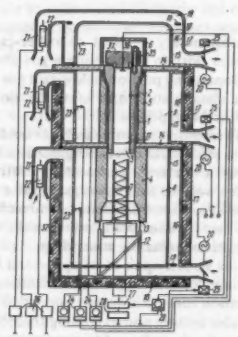
to said probe means to said analyzer assembly and through said exhaust line back to the duct.

3,960,501

APPARATUS FOR GROWING CRYSTALS FROM HYDROTHERMAL SOLUTIONS

Vladimir Petrovich Butuzov, Sirenevy bulvar 45, kv. 55, Moscow; Evgeny Konstantinovich Vatolkin, Vokzalnaya ulitsa 20, kv. 6, Alexandrov Vladimirskoi oblasti; Leonid Alexandrovich Gordienko, Bolshaya Semenovskaya ulitsa 21, kv. 87, Moscow; Ernst Borisovich Feldman, Snaiperskaya ulitsa 5, kv. 20, Moscow; Valentin Evstafievich Khadzhi, ulitsa Institutskaya 14, kv. 8, Alexandrov Vladimirskoi oblasti, and Anatoly Alexandrovich Shaposhnikov, 5 Vatutinsky pereulok 31, kv. 10, Moscow, all of U.S.S.R.

Filed Jan. 15, 1974, Ser. No. 433,495
Int. Cl.² B01D *9/02*; B01J *17/04*
U.S. Cl. 23—273 H **2 Claims**



1. Apparatus for growing crystals from hydrothermal solution, comprising: a vertically elongated autoclave; a crystallization zone in the top portion of said autoclave; a dissolution zone in the bottom portion of said autoclave; a heat insulation coating of said autoclave; a system of heating elements of said autoclave; a temperature controlled chamber accommodating said autoclave, said chamber being divided into three sections disposed one above another along the vertical extent of said chamber; a heating and temperature control system of each of said sections which ensures the maintenance of constant and different temperature values in each of said sections required for creation and maintenance of the desired temperature

fields in said crystallization and dissolution zones of said autoclave, said sections of the temperature controlled chamber each having double walls including an inner and outer walls with a space defined therebetween; and means for maintaining a constant temperature in said space and of said inner wall and comprising said heating and temperature control system.

3,960,502

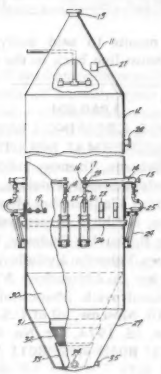
ABSORBER-CRYSTALLIZER TOWER INCLUDING SPRAY MEANS AND SCALE TRAP

Walter C. Saeman, Hamden, Conn., assignor to Olin Corporation, New Haven, Conn.

Division of Ser. No. 445,188, Feb. 25, 1974, and a continuation-in-part of Ser. No. 213,639, Dec. 12, 1971, abandoned. This application Nov. 11, 1974, Ser. No. 522,600

Int. Cl.² B01D *9/02*

U.S. Cl. 23—273 R **6 Claims**



1. In a substantially vertical absorber-crystallizer tower having an upper portion comprising a gas absorption zone, a lower liquid containing portion below said gas absorption zone comprising a classification and crystallization zone, the improvement which comprises:

a false downwardly and inwardly extending imperforate bottom in said liquid containing portion being open at its upper and lower ends and sealingly affixed at its upper end to the walls of said tower, said false bottom defining a crystallization zone thereabove and a classification zone between said inclined wall and the walls of said tower, an outlet from said classification zone,

a foraminous screen open at its upper and lower ends communicating between said crystallization zone and said classification zone, said screen appended to the lower end of said false bottom and extending therebelow and having apertures of a size selected to restrict passage of oversized material therethrough into said classification zone, the lower opening of said screen communicating with a scale trap positioned therebeneath, said scale trap being provided with a cleanout port to permit accumulated scale to be removed from the tower, plural opposed nozzles spaced horizontally about the lower perimeter of said gas absorption zone, said nozzles being arranged and adapted to direct sprays of gas absorbing liquid upwardly and inwardly into said gas absorption zone, and to avoid spray contact with said tower walls and to substantially maximize midair collision with said sprays eminating from said plural opposed nozzles, gas inlet and outlet means connected to said gas absorption zone.

3,960,503

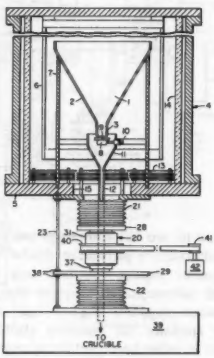
PARTICULATE MATERIAL FEEDER FOR HIGH TEMPERATURE VACUUM SYSTEM

Dale W. Rice, Horseheads, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Dec. 27, 1974, Ser. No. 537,042

Int. Cl.² B01J *17/18*; G01F *11/20*

U.S. Cl. 23—273 SP **5 Claims**



1. In an apparatus for growing single crystals from the melt including a gas-tight crystal growing furnace and a crucible therein for containing the melt, a feeder system for replenishing batch raw material to the crucible comprising:

A. an independent pre-heat furnace structure adjacent the crystal growing furnace including heating means and having an opening at the bottom thereof but otherwise being gas-tight,

B. a raw material hopper fixed within the pre-heat furnace and having an outlet opening at the bottom thereof positioned above the opening at the bottom of the preheat furnace,

C. a funnel means located within said preheat furnace and substantially axially beneath the hopper outlet opening for receiving raw material discharged therefrom, and including a conduit means extending downwardly from the funnel and extending into the crystal growing furnace, for transporting discharged raw material to the crucible in the crystal growing furnace,

D. metering means mounted for rotation relative to the hopper outlet opening and being positioned substantially axially below the outlet opening and above the conduit means, and having a flat upper surface positioned at such a distance below the hopper outlet opening and being of such size relative thereto that when stationary, the raw material falls from the hopper and accumulates on the flat upper surface, and when rotating, the raw material falls from the hopper to the flat upper surface and steadily flows to an edge thereof, thence constantly to the funnel,

E. means located outside the pre-heat furnace structure for rotating the metering means, and

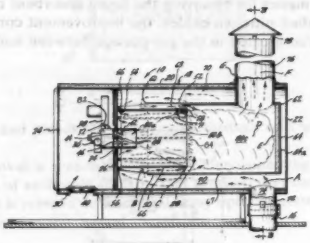
F. means for providing gas-tight seals on the opening at the bottom of the pre-heat furnace, between the pre-heat furnace and the conduit means, and between the crystal growing furnace and the conduit means.

3,960,504

POLLUTED AIR EFFLUENT INCINERATING APPARATUS

Lawrence C. Griffin, Seattle, Wash., assignor to Griffin Research & Development, Inc., Miami, Fla.

Filed Sept. 17, 1973, Ser. No. 397,947
Int. Cl.² F23G 7/06
U.S. Cl. 23—277 C 18 Claims



1. An incinerating apparatus adapted to accomplish substantially complete combustion of an effluent such as a polluted air effluent, said apparatus comprising:

a. a housing having a rear end, a forward end, a containing side wall and a longitudinal axis extending from the rear to the forward end of the housing,

b. a longitudinally aligned shell means located within said housing and spaced radially inwardly therefrom, said shell means defining a combustion area for incineration of said effluent,

c. said shell means defining with said housing a generally annular heat exchange passageway for flow of effluent therethrough, with the effluent in the passageway being in heat exchange relationship with said shell means so as to become heated from the shell means and cooling the shell means,

d. an effluent inlet to direct effluent into the forward end of said heat exchange passageway for flow rearwardly through said heat exchange passageway,

e. fuel inlet means at the rear of said housing and arranged to direct fuel forwardly into said combustion area to react with said effluent,

f. means defining a primary air inlet proximate said fuel inlet to provide a primary air inflow to react with said fuel at an initial combustion zone at the rear of said combustion area,

g. said shell means comprising an outer shell means defining a final combustion zone at a forward location of said combustion area,

h. said shell means further comprising another shell means spaced inwardly and rearwardly of said outer shell means and defining an intermediate combustion zone between said initial and final combustion zones,

i. means defining a secondary inlet at the rear portion of said other shell means communicating with said heat exchange passageway to provide a secondary flow of effluent into said intermediate combustion zone,

j. means defining a tertiary inlet between said outer and other shell means communicating with said heat exchange passageway to provide a tertiary flow of effluent into said final combustion zone, and

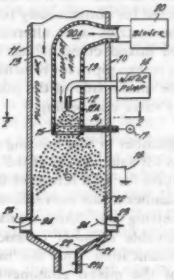
k. means defining an outlet from said combustion area to discharge the combustion products from said combustion area.

3,960,505

ELECTROSTATIC AIR PURIFIER USING CHARGED DROPLETS

Alvin M. Marks, 153-16 10th Ave., Whitestone, N.Y. 11357

Continuation-in-part of Ser. No. 211,350, Dec. 23, 1971, abandoned. This application Feb. 4, 1974, Ser. No. 439,264
Int. Cl.² C01B 17/82
U.S. Cl. 23—284 1 Claim



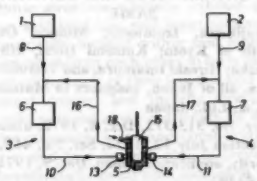
1. A gas purifier for removing noxious gases and particulates from a stream of gases comprising a first conduit to receive and direct the stream of gases therethrough, a source of water comprising a fluid bearing line containing water under positive pressure disposed within the conduit, a reactant for the noxious gases in said water, a second conduit within the first conduit around said water source and in communication with a source of clean air under pressure, an apertured charging electrode mounted in the second conduit downstream of the water source and within the clean air duct, a source of electrical potential connected between the charging electrode and the water source for creating an intense electric field between the water source and the charging electrode to simultaneously charge and sub-divide the water and reactant into submicron charged droplets as they move into the stream of gases within the first conduit and means downstream of the charging electrode to collect and discharge the charged water and reactant droplets together with the gases and particulates entrained thereby.

3,960,506

APPARATUS FOR PRODUCING HOMOGENEOUS MATERIALS OR FOAM FROM AT LEAST TWO INTER-REACTING COMPONENTS

Willi Schmitzer, Birlinghoven, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation of Ser. No. 146,373, May 24, 1971, abandoned. This application July 9, 1973, Ser. No. 377,490
Claims priority, application Germany, June 20, 1970, 2030516
Int. Cl.² B01F 5/10; C08G 69/04
U.S. Cl. 23—285 14 Claims



1. An apparatus for the production of homogeneous materials or foams from a plurality of components comprising:

a. a pipe system for each component, each pipe system including a delivery pipe having a pump operatively connected therein for providing the component under high pressure, and a return pipe connected to the delivery pipe at the intake side of the pump, for return of the component from the discharge side to the intake side of the pump,
b. a nozzle at the high pressure discharge end of each delivery pipe,
c. a three-way valve to which each of the nozzles and return pipes is connected for continuously receiving the components from the nozzles and, alternatively, mixing and discharging the mixed components, or delivering them unmixed to the return pipes for return of the components, unmixed, to the intake side of the pumps,
d. said three-way valve comprising:
1. a housing,
2. a movable member in said housing movable between a first position for said mixing of the components, and a second position for said return of the components,
3. a mixing chamber in the movable member for simultaneously receiving the components from the nozzles with the movable member in said first position, an outlet communicating with the mixing chamber for discharge of the mixed comonents components the mixing chamber and from the housing with the movable member in said first position, said mixing chamber being sealed from the nozzles with the movable member in said second position,
4. a return duct for each component in the movable member for receiving the components from the nozzles, and returning them independently to the return lines, with the valve in said second position, said return ducts being sealed from the nozzles with the valve in said first position,
e. said valve having:
1. inlet passageways in said housing leading from nozzles to the movable member,
2. housing outlet passageways leading from the movable member to the return pipes,
3. movable member inlets in the movable member positioned for communicating the housing inlet passageways with the mixing chamber with the movable member in said first position and further positioned so that the movable member inlets are sealed with respect to the housing inlet passageways with the movable member in said second position,
4. movable member return passageways in the movable member position for communicating the housing inlet passageways with the housing outlet passageways with the movable member in said second position for said delivery of the components to the return pipes and further positioned so that the housing inlet passageways are sealed with respect to the housing outlet passageways with the movable member in said first position.

3,960,507

APPARATUS FOR REMOVING NITROGEN OXIDES FROM A CONTAMINATED GAS CONTAINING THE SAME

Masahiro Tsujikawa, Izumiotsu; Minoru Ozasa; Fumio Takagi, both of Kyoto; Katsumi Hirai, Hirakata; Akio Iwasaki, Osaka; Hiroshi Imamura, and Testuhiro Ueda, both of Toyonaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

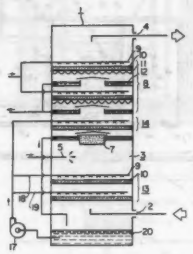
Division of Ser. No. 313,372, Dec. 8, 1972, abandoned. This application July 12, 1974, Ser. No. 488,118

Claims priority, application Japan, Dec. 9, 1971, 9942; Aug. 22, 1972, 47-84292

Int. Cl.[2] B01J *8/02*

U.S. Cl. 23—288 K **3 Claims**

1. In an apparatus for removing nitrogen oxides from a gas contaminated therewith, comprising a reactor vessel; an inlet port for supplying the contaminated gas to said vessel; a first reaction chamber in said vessel for receiving said contaminated gas; means for partially processing said contaminated gas comprising means for supplying high temperature steam to said first reaction chamber to convert at least a portion of the original nitrogen oxides in the contaminated gas to more soluble forms of nitrogen oxide; a second reaction chamber in said vessel for receiving the partially processed contaminated gas containing the converted nitrogen oxides; a gas passage between said first and second reaction chambers; means in said second reaction chamber for dispersing therein a liquid absorbent for absorbing the soluble nitrogen oxides; means for removing the resulting purified, relatively uncontaminated gas; and means for removing the liquid absorbent containing the absorbed nitrogen oxides: the improvement comprising a heat barrier located in the gas passage between said first and



second reaction chambers, said heat barrier comprising a layer of porous catalyst extending across substantially the entire cross sectional area of said passage which catalyst enhances the conversion of said nitrogen oxides to more soluble forms, a first preliminary reaction chamber in said vessel having means for preheating the contaminated gas before it enters said first reaction chamber, a second preliminary reaction chamber in said vessel located between said layer of porous catalyst and said second reaction chamber for providing additional thermal isolation between the first and second reaction chambers, and said second reaction chamber being provided with a corrugated plate located beneath the liquid absorbent dispersing means, said plate having a plurality of small holes in the troughs of the corrugations through which the liquid absorbent drips to obtain more uniform contact between the ascending gas containing the converted nitrogen oxides and the liquid absorbent.

3,960,508

TROUGH-TYPE SCALE TRAPS

Glyndwr A. R. Bessant, Morristown; Paul D. Eichamer, Ironia; Robert M. Koros, Westfield, and Steven R. Schieni, Morristown, all of N.J., assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed Nov. 4, 1974, Ser. No. 520,485

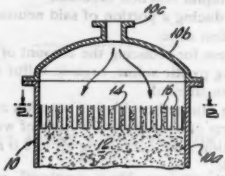
Int. Cl.[2] B01J *8/00;* **B01D** *50/00*

U.S. Cl. 23—288 R **10 Claims**

1. An array of scale traps disposed normal to the direction of flow of incoming feed entering catalyst beds in a reactor vessel for filtering particles contained in said feed and preventing them from entering said catalyst beds which are subject to plugging by said particles comprising:
a. a plurality of interlocked parallel scale traps, each of said traps disposed in a chordal direction across the cross-section of said reactor vessel and including a support frame which has a troughlike configuration in the direction of incoming feed flow, said frame including a flat elongated rectangular top having an opening normal to said incoming feed and a flat elongated rectangular bottom having an opening parallel to and downstream of said top opening, said frame having sides connecting said top to said

bottom, said traps transversely spaced apart a sufficient distance along the longer side of said top so that plugging of said beds is minimized;

b. screen wire mesh fastened only to said frame of each of said traps and covering only said sides and said bottom whereby fluid entering said top opening is filtered by said



trap and passes out of said trap through said wire mesh; and

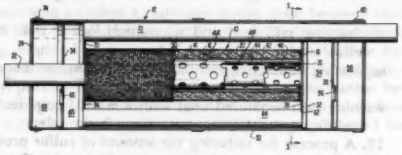
c. removable means for directly interconnecting adjacent ones of said scale traps in said array so that each of said traps is removable from said array upon disconnection of said removable means therefrom.

3,960,509

CATALYTIC MUFFLER

Raymond R. Abriany, 3840 Valley Brink, Los Angeles, Calif. 90039

Filed Dec. 30, 1974, Ser. No. 537,520
Int. Cl.² F01N *3/15*
U.S. Cl. 23—288 F **9 Claims**



1. A catalytic muffler comprising:

a. muffler walls defining an inner volume which is gas-tight except for entry and exit tubes recited hereinafter;

b. an entry tube which passes from the outside of the muffler walls into the inner volume defined by said muffler walls, said entry tube having a plurality of holes in the longitudinal wall thereof in the portion of said entry tube within the inner volume defined by said muffler walls;

c. a second tube at least a portion of which surrounds at least a portion of the portion of said entry tube within the inner volume defined by said muffler walls, said second tube likewise having a plurality of holes in the longitudinal wall thereof in the portion of said second tube surrounding said entry tube, the holes in said second tube being adjacent to but offset from the holes in said entry tube, whereby the combustion gasses passing through the muffler are required to follow circuitous paths in a first volume between said entry tube and said second tube;

d. a cartridge containing a catalytic converter surrounding at least the portion of said second tube which has holes in the longitudinal wall thereof; and

e. an exit tube which passes from the outside of the muffler walls into the inner volume defined by said muffler walls and which opens into that inner volume at a point on the side of said cartridge remote from said second tube;

said entry tube, said second tube, and said cartridge all extend into the muffler at least approximately the same distance, and

f. a first partition

i. extending transversely of the muffler at the inner ends of said entry tube, said second tube; and said cartridge,

ii. butting against the inner ends of said entry tube, said second tube, and said cartridge, and

iii. having at least three holes therethrough radially outside said cartridge;

g. a second partition

i. extending transversely of the muffler between said first partition and the point where said entry tube passes through said muffler walls,

ii. engaging the inside of said muffler walls, the outside of said entry tube, and the outer end of said second tube, and

iii. having at least two holes therethrough radially outside said cartridge; and

h. a third tube which extends from a hole in said first partition to a hole in said second partition,

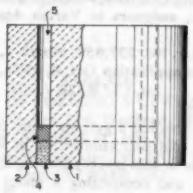
and wherein said exit tube extends from a hole in said second partition, through a hole in said first partition, and through said muffler walls at a point on the side of said first partition remote from said second partition, whereby the combustion gasses passing through the muffler pass through the holes in said entry tube into the first volume, then through said second tube and said cartridge into a second volume defined by said muffler walls, the outer surface of said cartridge, and said first and second partition, then through one or more holes in said first partion into a third volume defined at least in part by said muffler walls and said first partition, then through said third tube into a fourth volume defined at least in part by said muffler walls and said second partition, and then through said exit tube to the outside of the muffler.

3,960,510

HONEYCOMB STRUCTURE FOR COUNTERCURRENT GAS FLOW

Francis John Sergeys, Kensington, Md., assignor to W. R. Grace & Co., New York, N.Y.

Filed May 21, 1973, Ser. No. 362,622
Int. Cl.² B01J *8/02*, *35/04*; F01N *3/15*
U.S. Cl. 23—288 FB **1 Claim**



1. A two stage converter for treating engine exhaust gases which comprises in combination a housing having end walls and a center tubular wall section, an exhaust gas inlet at one end of said housing, an elongated ceramic monolithic structure contained within said housing, said monolithic space having an inner longitudinally channelled section and an outer longitudinally channelled section, said exhaust gas inlet being connected to and in communication with the inner section of said monolithic structure whereby exhaust gases will pass directly from said inlet into said inner section, said sections being concentrically located within said housing and being annularly separated from each other to form an annular space therebetween along most of their lengths, said space preventing mechanical contact and thereby direct heat transfer contact of said sections along the length of said space, said sections being connected by a honeycomb bridge, said annular sapce being sealed by a ceramic plug to prevent exhaust gas backflow therethrough, an air inlet located at the end wall of said housing opposite said exhaust gas inlet, a baffle positioned perpendicular to said air inlet and said exhaust gas flow and an outlet plenum at the end of said housing opposite said

air inlet and communicating with an outlet port said outlet plenum being defined by the end wall of said housing nearest said inlet, a portion of said center tubular wall abutting said end wall, the outer wall of said inlet and an end face of the outer longitudinally channeled section, said outlet plenum communicating the gases flowing through said outer section with the outlet port.

3,960,511

ZONE MELTING PROCESS

Wilhelm H. Kuhlmann-Schäfer, Hannover, Germany, assignor to Preussag Aktiengesellschaft, Germany

Continuation of Ser. No. 270,695, July 11, 1972, abandoned. This application Aug. 5, 1974, Ser. No. 494,979

Claims priority, application Germany, July 15, 1971, 2135306

Int. Cl.² B01J *17/18*

U.S. Cl. 23—301 SP **7 Claims**

1. A Process of zone melting a charge utilizing at least a pair of solid, spaced electrodes each having a tapered end and means for producing a current in said electrodes, said charge and electrode tapered ends being of substantially the same material, comprising the steps of:

placing said tapered ends of said pair of electrodes in lateral, waxial, direct physical contact with the perimeter of said charge, said charge separating said electrodes;

then passing said current between said electrodes and transversely through said charge to resistantly heat said charge and melt a zone therein, said current passing solely through said zone between said electrodes;

enclosing at least a portion of said charge with said electrodes to support and maintain said zone; and

moving said charge relative to said electrodes at a predetermined velocity, said zone migrating longitudinally through said charge at said predetermined velocity.

3,960,512

FERRITE TO METAL BOND FOR HIGH-POWER MICROWAVE APPLICATIONS

Victor A. Vaguine, Palo Alto, and Dennis R. Nichols, San Jose, both of Calif., assignors to Varian Associates, Palo Alto, Calif.

Division of Ser. No. 337,059, March 1, 1973, Pat. No. 3,873,944. This application Oct. 8, 1974, Ser. No. 513,030

Int. Cl.² B32B *15/04*

U.S. Cl. 29—195 **9 Claims**

1. A seal for bonding a gyromagnetic ferrite member to a metal member, said seal comprising at least three metallic layers, a first one of said layers adhering to said gyromagnetic ferrite member and comprising a metal selected from the group consisting of nichrome, molybdenum and chromium, a second one of said layers adhering to said first layer and comprising copper, and a third one of said layers adhering to said second layer and comprising gold, said third layer being bonded to said metal member by solder.

3,960,513

METHOD FOR REMOVAL OF SULFUR FROM COAL

Jagdish Chandra Agarwal, Concord; Richard Andre Giberti, Waltham, and Louis John Petrovic, Sudbury, all of Mass., assignors to Kennecott Copper Corporation, New York, N.Y.

Filed Mar. 29, 1974, Ser. No. 456,047

Int. Cl.² C10L *9/00;* **C10B** *17/00*

U.S. Cl. 44—1 R **23 Claims**

1. A process for reducing the amount of free and combined sulfur in coal and removing of same from coal comprising the steps of:

introducing a crushed coal into a reaction zone in an aqueous medium in the presence of oxygen whereby the ratio of coal to oxygen to water based on weight percent is from 1.0:0.085:99 to 1.0:0.18:0.667;

reacting oxygen with said sulfur in said coal for a period sufficient to convert said sulfur in said coal to a soluble species thereof, or elemental sulfur;

separating said liquid reaction medium from said coal;

working up said coal whereby sulfur of elemental, pyritic or organic origin is removed;

neutralizing said reaction medium with a neutralizing liquor whereby iron and a sulfate is precipitated from the neutralized, liquid reaction medium;

and reintroducing a portion of said neutralizing liquor into the reaction zone.

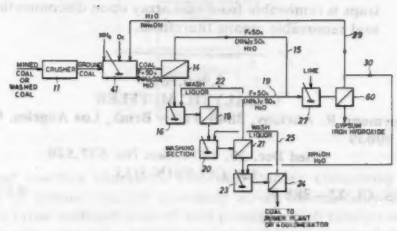
16. A process for reducing the amount of sulfur present in coal, including pyritic sulfur, organic sulfur and sulfate sulfur comprising the steps of:

introducing crushed coal into a reaction zone as a slurry of 1–60 parts of coal to 40–99 parts of water, the water in the reaction zone containing up to 3.0 molar ammonium hydroxide;

introducing an oxygen containing gas into said reaction zone at a pressure from 0 to 1000 psig;

maintaining said pressure in said reaction zone for a period of 15 minutes to 24 hours;

maintaining the reaction zone within said period at a temperature from 50° to 450°F;



discharging said coal and a reaction liquor rich in iron sulfate and ammonium sulfate;

separating said coal and said reaction liquor from each other; and

washing said separated coal with a wash liquor including wash liquor containing ammonium hydroxide.

19. A process for reducing the amount of sulfur present in coal, including pyritic sulfur, organic sulfur and sulfate sulfur comprising the steps of:

introducing a crushed coal into a reaction zone as a slurry of 1–60 parts of coal to 40–99 parts of water, adding to said aqueous slurry sufficient acid to maintain an acid concentration of from .001 to 1.0 molar acid;

introducing an oxygen containing gas into said reaction zone at a pressure from 0 to 1000 psig;

maintaining said pressure in said reaction zone for a period of 15 minutes to 24 hours;

maintaining the reaction zone within said period at a temperature from 50° to 450°F;

discharging said coal and elemental sulfur and a reaction liquor rich in iron sulfate and said acid;

separating said coal and said reaction liquor from each other; and

washing said coal with a wash liquor.

3,960,514

SYNERGISTIC ORGANIC SOLVENT GELLANT

James Teng, St. Louis County, and Marcella C. Stubits, St. Louis, both of Mo., assignors to Anheuser-Busch, Incorporated, St. Louis, Mo.

Filed Apr. 1, 1974, Ser. No. 456,795

Int. Cl.² C10L *7/00;* **B01J** *13/00*

U.S. Cl. 44—7 B **15 Claims**

1. A gelled hydrocarbon or non-polar solvent comprising an amount of hydroxypropyl cellulose laurate sufficient to gel

said hydrocarbon or non-polar solvent, said hydroxypropyl cellulose laurate having a degree of molecular substitution of hydroxypropyl groups of 2–6 and a degree of substitution of laurate groups between about 2 and 3 and an amount of an additive to synergistically affect the viscosity of the gel, said additive being an elastomer of the polybutadiene or butadiene-styrene copolymer type.

3,960,515

HYDROCARBYL AMINE ADDITIVES FOR DISTILLATE FUELS

Lewis R. Honnen, Petaluma, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation of Ser. No. 405,707, Oct. 11, 1973, Pat. No. 3,898,056, which is a continuation-in-part of Ser. No. 318,064, Dec. 26, 1972, abandoned, which is a continuation-in-part of Ser. No. 318,063, Dec. 26, 1972, abandoned. This application Feb. 19, 1974, Ser. No. 443,939

The portion of the term of this patent subsequent to Aug. 5, 1992, has been disclaimed.

Int. Cl.² C10L *1/22*

U.S. Cl. 44—58 **16 Claims**

1. A composition of matter comprising a mixture of a high molecular weight hydrocarbyl amines and a low molecular weight hydrocarbyl amines wherein a weight ratio of low to high molecular weight amines present within said mixture is between about 0.5 and 5:1; said high molecular weight hydrocarbyl amines being prepared by reacting a first hydrocarbyl halide having a number average molecular weight in the hydrocarbyl portion of 1,900 to 5,000 with a mono- or polyamine having from 1 to 10 amine nitrogens and from 2 to 40 carbons with a carbon to nitrogen atomic ratio between about 1 and 10:1; and said low molecular weight hydrocarbyl amines being prepared by reacting a second hydrocarbyl halide having a number average molecular weight in said second hydrocarbyl portion of 300 to 600 with a mono- or polyamine having from 1 to 10 amine nitrogens and from 2 to 40 carbons with a carbon to nitrogen atomic ratio between about 1 and 10:1.

3,960,516

GRINDING WHEEL MANUFACTURE

Giuseppe Biardi, Corsico (Milan), Italy, assignor to Norton Company, Worcester, Mass.

Filed May 10, 1974, Ser. No. 468,721

Claims priority, application Italy, May 29, 1973, 24692/73

Int. Cl.² B24B *5/04*; C09K *3/14*

U.S. Cl. 51—293 **1 Claim**

1. In the process of manufacturing a generally cylindrical cup shaped grinding wheel formed of a thin hollow cylindrical grinding element having a radial thickness much less than its axial length, and a plastic element on one end of the cylinder for supporting the grinding wheel on a spindle, the improvement which comprises positioning the cylindrical grinding element in a mold with said end extending into a cavity in the mold with both the inner and outer surfaces of the cylinder at said end being exposed to said cavity, forming said plastic element onto said end by filling said cavity with liquid injection molding plastic under pressure, whereby said cylinder is subjected to equalized radial forces resulting from the injection molding pressure, solidifying said plastic, and removing the finished grinding wheel from the mold.

3,960,517

RESINOID WHEEL CONTAINING A MIXTURE OF TRIMANGANESE TETRAOXIDE AND FERROXIDE AND FERRIC OXIDE FILLERS

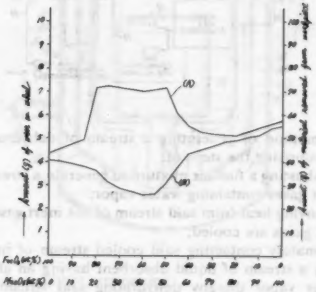
Junichi Ukita, Sennan, Japan, assignor to The New Registon Company, Limited, Japan

Filed Jan. 14, 1975, Ser. No. 540,959

Claims priority, application Japan, Oct. 23, 1974, 49-122067

Int. Cl.² C09K *3/14*

U.S. Cl. 51—298 R **4 Claims**



1. In a resinoid wheel containing abrasive grains, a thermoset resin binder and a filler, the filler being present in an amount of 1 to 20 parts by weight of abrasive grains, the improvement which is characterized in that of the total amount filler in the wheel, 30% to 70% is a mixture of 20 to 55 weight % of trimanganese tetraoxide and 80 to 45 weight % of ferric oxide.

3,960,518

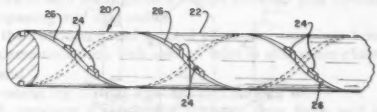
METHOD OF FORMING A CUTTING TOOL

George H. Hall, P.O. Box 244, Westford, Mass. 01886

Division of Ser. No. 380,831, July 19, 1973, Pat. No. 3,886,926. This application Dec. 30, 1974, Ser. No. 537,675

Int. Cl.² B24D *3/02*

U.S. Cl. 51—309 R **5 Claims**



1. A method of forming a flexible, endless wire saw which has distributed on its cutting surface a plurality of spaced-apart blocks of composite material formed of comminuted abrasive in a bonding matrix comprising the step of

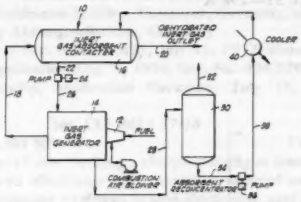
placing under pressure and between said blocks and said surface, a braze comprising a metallic copper-containing layer sandwiched between metallic silver-containing layers,

heating said braze to melt said silver-containing layers, and cooling said melted layers to hardness.

3,960,519
METHOD AND SYSTEM FOR GENERATING A DEHYDRATED INERT GAS STREAM

Harold O. Ebeling, Tulsa, Okla., and Robert E. McMinn, Spring, Tex., assignors to Black, Sivalls & Bryson, Inc., Houston, Tex.

Filed Apr. 18, 1975, Ser. No. 569,274
Int. Cl.² B01D 47/00
U.S. Cl. 55—31 **24 Claims**



1. A method of generating a stream of dehydrated inert gases comprising the steps of:

a. combusting a fuel-air mixture to generate a stream of hot inert gases containing water vapor;

b. removing heat from said stream of hot inert gases so that said gases are cooled;

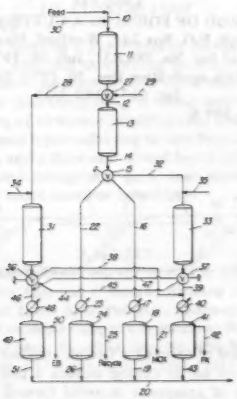
c. intimately contacting said cooled stream of inert gases with a stream of liquid absorbent having an affinity for water vapor thereby dehydrating said stream of inert gases; and

d. utilizing heat removed from said stream of hot inert gases in step (b) to reconcentrate said stream of liquid absorbent.

3,960,520
SEPARATION OF ISOMERS

Paul T. Allen, Beaumont, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 19, 1975, Ser. No. 559,842
Int. Cl.² B01D 53/04, 15/08
U.S. Cl. 55—59 **10 Claims**



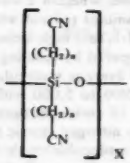
1. In a method for the separation and recovery of the isomers contained in an aromatic mixture comprising para-xylene, meta-xylene, ortho-xylene and ethyl-benzene to separate this mixture into one stream comprising meta-xylene and ortho-xylene and a second stream comprising para-xylene and ethyl benzene, by a process which includes conducting said mixture through an elongated bed of zeolite adsorbent contained in a column whereby paraxylene and ethyl benzene are substantially adsorbed and meta-xylene and ortho-xylene are substantially not adsorbed, the improvement which comprises contacting said mixture in vapor phase with said zeolite adsorbent to effect adsorption of at least a major amount of the para-xylene and ethyl benzene and separately desorbing the adsorbed para-xylene and ethyl benzene simultaneously from each of a plurality of portions of said bed.

3,960,521
HIGH TEMPERATURE POLAR STATIONARY PHASE FOR GAS CHROMATOGRAHY

Richard F. Kruppa, State College, Pa., and Arthur Edward Coleman, Troy, N.Y., assignors to Applied Science Laboratories, Inc., State College, Pa. and Silar Laboratories, Inc., Watervliet, N.Y.

Filed Mar. 1, 1974, Ser. No. 447,335
Int. Cl.² B01D 15/08
U.S. Cl. 55—67 **8 Claims**

1. In the gas-liquid chromatographic separations of chemical compounds the method which comprises: passing a mixture of chemical compounds and a carrier gas through an elongated mass of supporting material maintained in the temperature range of 20°C to 275°C having thereon a stationary phase consisting of the silicone having recurring units of the formula:



which results in a separation of the chemical compounds.

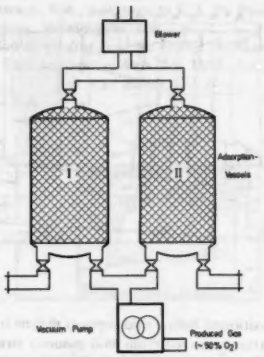
3,960,522
CARBON-CONTAINING MOLECULAR SIEVES

Heinrich Munzner, Essen-Kray; Heinrich Heimbach, Bochum; Werner Korbacher, Essen-Borbeck; Werner Peters, Wattenscheid; Harald Juntgen, Essen-Heisingen; Karl Knoblauch, Essen, and Dieter Zundorf, Essen-Heisingen, all of Germany, assignors to Bergwerksverband GmbH, Essen, Germany

Division of Ser. No. 161,211, July 9, 1971, Pat. No. 3,801,513.
This application Feb. 21, 1974, Ser. No. 444,383
Claims priority, application Germany, Apr. 23, 1971, 2119829
The portion of the term of this patent subsequent to Apr. 2, 1991, has been disclaimed.
Int. Cl.² B01D 53/14
U.S. Cl. 55—68 **17 Claims**

1. A method of separating oxygen from gas mixtures containing oxygen and nitrogen, comprising passing a gas mixture which contains oxygen and nitrogen through a carbon containing molecular sieve prepared by heating in a closed oven in the absence of air at a coking temperature of at least 600°C, particles of a cokable substance having a size between 0.1 and 20 millimeters until the content of volatile components in the resulting coke is not more than 5% by weight and thereafter subjecting the resulting coke to heating in an inert atmosphere at a temperature between 600° and 900°C while a gaseous stream of a carbonaceous substance which splits off carbon at said temperature is passed into contact with the said coke for such a period between 1 and 60 minutes that the carbon that is thus split off is deposited in the pores of the coke and re-

duces the effective average size of the pores to less than about 0.3 millimicron, whereby the oxygen in said gas mixture is



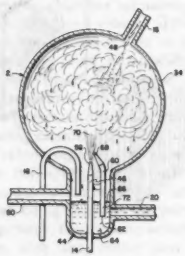
more rapidly adsorbed by said molecular sieve than the nitrogen in said gas mixture.

3,960,523

EFFLUENT GAS MONITOR

James R. Ryan, New Kensington, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Apr. 21, 1975, Ser. No. 570,271
Int. Cl.² B01D 47/06
U.S. Cl. 55—84 **8 Claims**



1. An apparatus for removing effluent from an effluent-bearing gas comprising:

a generally spherical main chamber having an effluent-bearing gas inlet for introducing said gas into said main chamber,

a reservoir in communication with said main chamber for providing vaporized liquid to said main chamber and for receiving condensed liquid from said main chamber,

a conduit having an inlet in said reservoir and an outlet adjacent said gas inlet for drawing liquid from said reservoir and vaporizing said liquid into said effluent-bearing gas by action of said gas passing from said gas inlet,

said main chamber having means for removing processed gas from said main chamber,

liquid supply means for providing liquid to at least one of said main chamber and said reservoir, and

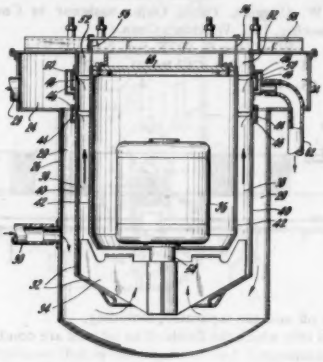
means for withdrawing liquid from said reservoir.

3,960,524

AIR SCRUBBER

Edward H. Cumpston, Jr., 43 Monument Ave., Old Bennington, Vt. 05201

Continuation-in-part of Ser. No. 429,214, Dec. 28, 1973, abandoned, which is a continuation-in-part of Ser. No. 280,950, Aug. 16, 1972, abandoned. This application Oct. 29, 1974, Ser. No. 518,467
Int. Cl.² B01D 47/16
U.S. Cl. 55—86 **39 Claims**



1. An air scrubber comprising:

a. means forming inner and outer concentric annular chambers separated by a fixed cylindrical common wall;

a fan arranged in one end region of said inner chamber for drawing from substantially the entire annular extent of said outer chamber and outputting into substantially the entire annular extent of said inner chamber;

c. said inner chamber being substantially unobstructed;

d. the inside of said cylindrical wall being substantially smooth and radially uniform to produce a substantially even flow of air and liquid all around any radial extent of said cylindrical wall;

e. means forming a clean air outlet from the end of said inner chamber opposite said fan;

f. a quantity of liquid in said scrubber;

g. said cylindrical wall having a circulation opening arranged between said inner chamber downstream of said fan and said outer chamber upstream of said fan;

h. said circulation opening intercepting the entire path of said output from said fan;

i. means forming a contaminated air inlet into said outer chamber upstream of said circulation opening;

j. said cylindrical wall having a plurality of bore-hole size aerosol eliminator openings extending through said cylindrical wall throughout a region between said circulation opening and said outlet;

k. the outside of said aerosol eliminator openings being in communication with said air inlet in said outer chamber; and

l. means for turning said fan fast enough to:

1. produce a substantial pressure drop from said inner chamber to said outer chamber to force a portion of said air and substantially all of said liquid through said circulation opening into said outer chamber in a high-velocity spray of liquid particles directed into incoming air from said inlet and to draw a portion of said air and substantially all aerosol particles through said aerosol eliminator openings and back into said outer chamber;

2. continuously move all of said quantity of liquid along with rapidly moving air and to break said liquid into finely divided particles; and

3. drive said liquid particles and air in a high-velocity helical path in said inner chamber to subject said air

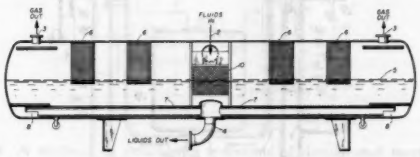
and said liquid particles to a very high centrifugal force centrifugally concentrating said liquid particles near said cylindrical wall and helping to force said liquid through said circulation opening and to draw said aerosol through said aerosol eliminator openings.

3,960,525

OIL-GAS SEPARATOR HAVING DEFOAMING STRUCTURE

Robert W. Coggins, Tulsa, Okla., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed May 9, 1975, Ser. No. 575,914
Int. Cl.² B01D *19/02*
U.S. Cl. 55—178 **2 Claims**



1. An oil and gas separator, including,

a shell into which the fluids of an oil well are conducted for separation,

an inlet connected through the wall of the shell and sized to conduct the mixture of fluids into the shell,

an outlet connected through the upper wall of the shell and remotely spaced from the inlet to conduct separated gas from the shell,

an outlet connected through the lower wall of the shell and remotely spaced from the inlet to conduct separated liquids from the shell,

a plurality of multi-surfaced packing structures held in a body with a foraminous structure mounted at a fixed location within the shell and below the inlet so as to receive the fluid mixture to liquid pack the interstices of the body, whereby the gaseous bubbles will not be fragmented and additional foam developed as the liquids are deenergized and flow to the lower portion of the shell while the gas separates from the mixture and flows to the upper portion of the shell, and a diverting structure mounted at the inlet formed and arranged to direct the liquid downward over the packing body.

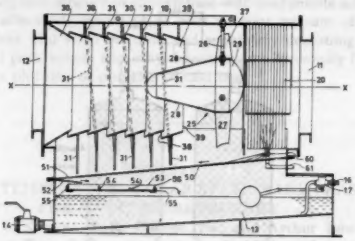
3,960,526

PARTICLE SEPARATING APPARATUS

John S. Andrews, Barry, Wales, assignor to H. H. Robertson Company, Pittsburgh, Pa.

Filed Dec. 20, 1974, Ser. No. 534,821
Claims priority, application United Kingdom, Jan. 29, 1974, 4081/74
Int. Cl.² B01D *50/00*
U.S. Cl. 55—227 **9 Claims**

1. Apparatus for separating particulate matter entrained in a gaseous stream, said apparatus including a casing having an inlet opening, an outlet opening and a longitudinal axis passing through the inlet and outlet openings; an impingement screen disposed across said inlet opening, said impingement screen comprising a plurality of impingement elements supported in spaced-apart parallel relation, normal to said longitudinal axis, each of said impingement elements having a V-shaped transverse profile including an apex confronting said inlet opening and arms diverging from said apex away from said inlet opening; a series of radially extending vanes positioned between said impingement screen and said outlet opening and arranged to impart swirl to said gaseous stream; a series of frustoconical rings positioned between said vanes and said outlet opening; support means positioned between said casing and said rings and supporting said frustoconical rings in coaxially aligned overlapping relation, said support means comprising a helix;



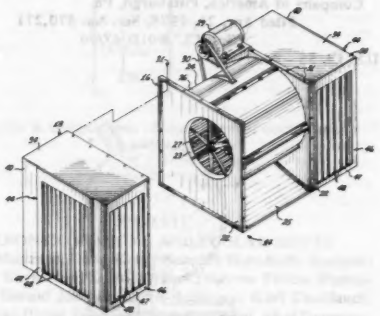
and a sump positioned below said support means for receiving particulate matter removed from said gaseous stream.

3,960,527

AIR DELIVERY AND TREATMENT APPARATUS

Adam D. Goettl, 4960 E. Palomino Road, Phoenix, Ariz. 85018

Filed Nov. 22, 1974, Ser. No. 526,392
Int. Cl.² B01D *51/10*
U.S. Cl. 55—269 **6 Claims**



5. An air handling apparatus comprising:

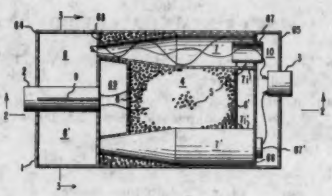
a. a centrifugal blower assembly having a motor driven air moving blower wheel impeller rotatably mounted between a pair of spaced substantially parallel side walls at least one of which has an axial air inlet opening formed therein, the side walls interconnected with a spiral shaped member to provide a chamber around the impeller and to form a centrifugal air outlet from the chamber; and

b. an enclosed cabinet affixed to the one side wall of said centrifugal blower assembly which has the axial air inlet opening formed therein, said cabinet having an interior compartment which is in communication with the axial air inlet formed in the one side wall of said centrifugal blower assembly, said cabinet having an air supply opening formed therein through which air is supplied to the interior compartment of said cabinet, the air supply opening of said cabinet being disposed in a wall thereof which is substantially in the same plane as the centrifugal air outlet of said centrifugal blower assembly and is disposed laterally adjacent thereto.

3,960,528
MUFFLER PARTICULATE TRAP FOR INTERNAL COMBUSTION ENGINES

Emmett Smith Jacobs, Wilmington, Del., and Vincent Edward Liberi, Newark, Md., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 339,127, March 8, 1973, abandoned. This application Feb. 25, 1975, Ser. No. 552,866
Int. Cl.² B01D 45/12
U.S. Cl. 55—346 **4 Claims**



1. An exhaust muffler particulate trap for attenuating the sound and removing solid particles from the exhaust of an internal combustion engine that is operated on fuel containing tetraalkyllead compounds and lead-scavenging compounds, said trap comprising

i. an elongated housing having an inlet port at one end for connection with the exhaust gas stream of said engine, and an outlet port at the other end communicating with the atmosphere, said housing also having an agglomerating chamber and an inertial cyclone separator communicating with a particulate collection chamber, said agglomerating chamber, cyclone separator and collection chamber being located within said housing, said agglomerating chamber being in communication with said inlet port through a plenum located between the collection chamber and the agglomerating chamber, said collection chamber located at the inlet port end of the housing;

ii. said agglomerating chamber containing refractory alumina pellets having a pore volume in the range of 0.1 to 0.9 cc per gram and a surface area in the range of 50 to 700 square meters per gram, said alumina being nonreactive with the exhaust gas constituents;

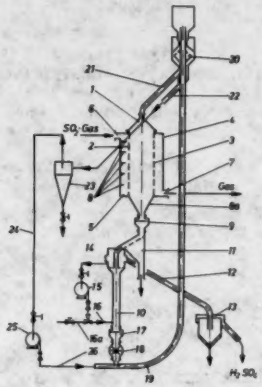
iii. said cyclone separator having an inlet, a particulate outlet and a gas outlet, and being in communication with said agglomerating chamber through the cyclone separator inlet, the cyclone separator also communicating with said particulate collection chamber wherein particulates are collected and retained, communication with the collection chamber being through the particulate outlet of the cyclone separator, the cyclone separator also being in communication with the outlet port of the housing through the cyclone separator gas outlet.

3,960,529
APPARATUS FOR REMOVING SULFUR OXIDE FROM EXHAUST GASES

Harald Juntgen, Essen-Heisingen; Karl Knoblauch, Essen; Gunther Gappa, Gelsenkirchen-Buer, and Jurgen Schwarte, Essen-Reilinghausen, all of Germany, assignors to Bergwerksverband GmbH, Essen, Germany

Division of Ser. No. 81,350, Oct. 16, 1970. This application Feb. 17, 1972, Ser. No. 227,100
Int. Cl.² B01D 53/06
U.S. Cl. 55—390 **9 Claims**

1. Apparatus for the treatment of exhaust gases containing water vapor, oxygen and sulfur oxide, comprising, in combination, an elongated adsorption vessel having an adsorbent inlet and an adsorbent outlet spaced in the direction of the elongation of said vessel from said adsorbent inlet so as to form between said inlet and said outlet an elongated adsorption zone through which a stream of granular carbon containing adsorbent is adapted to move from said inlet to said outlet; and means for moving exhaust gases containing vapor, oxygen and sulfur oxide transversely through said elongated adsorption zone, said moving means being constructed and arranged

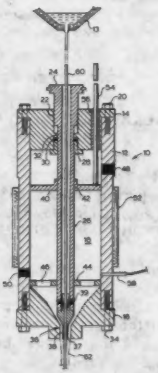


in such a manner that in the region of said elongated adsorption zone nearer to said adsorbent inlet each volume unit of said adsorbent stream is traversed by a greater amount of exhaust gases per unit of time than in the region of said adsorbent zone nearer to said adsorbent outlet.

3,960,530
METHOD OF COATING A GLASS FIBER FILAMENT

Rama Iyengar, Dollard des Ormeaux, Canada, assignor to Northern Electric Company Limited, Montreal, Canada

Filed July 29, 1975, Ser. No. 599,996
Int. Cl.² C03C 25/02
U.S. Cl. 65—3 C **5 Claims**



1. A method of coating a continuous glass fiber filament by the extrusion of plastic, comprising the steps of:

charging with plastic coating material a closed vertical cylinder having a die aperture in the lower end thereof and an axial core tube terminating in the die aperture to form an annular orifice, the plastic being liquified to pass through the die orifice;

drawing the filament, from a source of molten glass coaxial with the core tube, continuously through the core tube; and

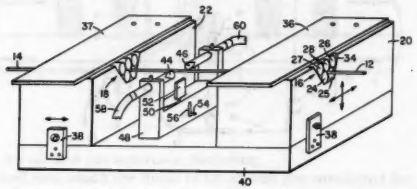
introducing pressurized gas into the upper portion of the cylinder to force the liquified plastic through the annular orifice and onto the filament.

3,960,531

METHOD AND APPARATUS FOR SPLICING OPTICAL FIBERS

Youssef Kohanzadeh, Corning, and Roy E. Smith, Horseheads, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed July 28, 1975, Ser. No. 599,854
Int. Cl.² C03B *23/20*
U.S. Cl. 65—4 B **12 Claims**



1. A method of splicing glass optical fibers comprising the steps of

aligning the end portions of said fibers so that the axes thereof are substantially parallel and the endfaces thereof are in contact,

generating an electric field at the junction between said fibers which is of sufficient magnitude to create an electric arc, said arc producing a sufficient amount of heat to melt the endfaces of said fibers, thereby causing said fibers to fuse, and

generating a magnetic field in the vicinity of said fiber junction, said magnetic field having a component parallel to the axes of said fibers, one of said electric field and said magnetic field varying with respect to time, the other being invariable with respect to time said magnetic field deflecting said arc back and forth along said fiber junction.

3,960,532

PREPARING ALKALI METAL SILICATE GLASS WITH BUBBLES

Frank J. Lazet, Media, Pa., assignor to Philadelphia Quartz Company, Valley Forge, Pa.

Continuation-in-part of Ser. No. 448,105, March 4, 1974, abandoned. This application May 29, 1975, Ser. No. 582,070
Int. Cl.² C03B *19/08*; C01B *33/32*; C03C *3/00*
U.S. Cl. 65—22 **8 Claims**

1. The process for producing alkali metal silicate glass having a mol ratio of 1.5 to 4.5 parts of SiO_2 per part of M_2O wherein M is selected from the group consisting of sodium, potassium and mixtures of sodium and potassium and containing 0.05 to 2% water and sufficient bubbles to promote fracturing, comprising the steps of:

a. charging raw materials, sources of alkali selected from the group consisting of sodium carbonate, potassium carbonate and mixtures of sodium carbonate and potassium carbonate, and a source of silica such as sand into an open hearth furnace with a bed area for fusion reactions, equipped with a draw hole and charging ports;

b. maintaining the temperature within said furnace above 1093°C so that a bed of molten silicate glass is formed and the unreacted raw materials float on said molten glass bed;

c. introducing dry saturated steam under pressure into the molten glass through bubbling means located in the furnace bed area so that bubbles of steam pass from the bottom of said molten glass bed to the top, the pressure of said steam being regulated to produce bubbles 8 to 18 inches (20.3 to 45.7 cm) in diameter breaking the surface of the molten blass at a rate of 5 to 20 bubbles per second; and

d. withdrawing said molten glass from the furnace.

3,960,533

LAMP HAVING CRYSTALLIZABLE LIGHT DIFFUSING ENVELOPE

Gordon P. K. Chu, Danvers, Mass., assignor to GTE Sylvania Incorporated, Danvers, Mass.

No Drawing. Division of Ser. No. 399,10u, Sept. 20, 1974, Pat. No. 3,885,182. This application Sept. 23, 1974, Ser. No. 508,497
Int. Cl.² C03B *32/00*
U.S. Cl. 65—33 **2 Claims**

1. The method of making an incandescent lamp having a light diffusing glass envelope comprising the steps of: forming an incandescent lamp envelope from a crystallizable glass having the following composition:

Li_2O	8 to 20%
Na_2O and/or K_2O	1 to 7%
SiO_2	45 to 72%
Al_2O_3	4 to 20%
CaO and/or SrO and/or BaO and/or MgO	0.6 to 7%
B_2O_3	1 to 4%
As_2O_3 and/or Sb_2O_3 and/or P_2O_5 and/or MoO_3	2 to 7%;

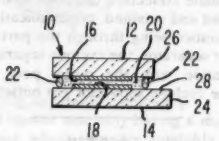
crystallizing said envelope in two steps by heating the envelope to a first stage crystallization temperature of about 500° to 565°C for a period about 10 minutes and then to a second stage crystallization temperature of about 750° to 800°C for a period between 10 to 20 minutes; and heat sealing said crystallized envelope to the flare of a stem pressed glass mount made of low temperature soft glass.

3,960,534

METHOD OF ASSEMBLING A LIQUID CRYSTAL CELL

William Lee Oates, Bernardsville, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 29, 1974, Ser. No. 464,762
Int. Cl.² B32B *3/02*; C03C *27/00*; E06B *3/24*
U.S. Cl. 65—43 **2 Claims**



1. A method of assembling a liquid crystal cell comprising:

disposing on a first glass substrate having a conductive layer thereon a narrow glass frit strip on said conductive layer substantially parallel to the edges of said first substrate but spaced therefrom and having at least three reentrant portions at intervals which extend to a greater distance from the edges of said first substrate than do the remaining portions of said strip,

mounting three or more spacer plates in overlapped relation with a portion of said first substrate between the edges of said substrate and said strip at the reentrant portions thereof thereby avoiding contact between said spacer plates and said strip,

disposing a second glass substrate having a conductive layer thereon on said first substrate such that said conductive

layers face each other and said second substrate rests on said glass frit such that all of its edges extend beyond said frit,

heating the resultant assembly under pressure to melt the frit, thereby forcing the second substrate against the first substrate until both substrates contact said spacer plates to thereby establish a predetermined spacing between said substrates, and

cooling to provide a rigid seal between said substrates for maintaining said predetermined spacing.

3,960,535

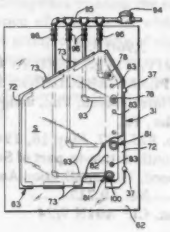
METHOD OF AND APPARATUS FOR BENDING GLASS SHEETS

Harold E. Hamilton, Toledo, and Waldemar W. Oelke, Rossford, both of Ohio, assignors to Libbey-Owens-Ford Company, Toledo, Ohio

Filed Sept. 13, 1974, Ser. No. 505,550

Int. Cl.² C03B *23/02, 27/00*

U.S. Cl. 65—104 **11 Claims**



1. A method of bending and heat treating a sheet of glass comprising: heating a sheet of glass having at least one opening therethrough to the softening point of the glass, supporting the heated sheet on a shaping surface of a press member, moving said press member toward a complemental shaping surface of a second press member during a bending cycle to press said sheet therebetween and impart the desired curvature to said sheet, and applying supplemental heat to at least one surface of said sheet in the region of said opening only while said sheet is supported on said shaping surface during said bending cycle to condition said sheet for subsequent tempering.

5. In apparatus for bending a heat softened glass sheet having at least one opening therethrough by pressing the same between opposed complemental shaping surfaces formed on opposed press members at least one of which is movable toward and away from the other during the bending cycle and includes a base member and a shaping rail mounted on said base member; the improvement in which means are mounted on said one press member for applying localized heat to at least one opposite surface of said sheet in the region of said opening while supported on said shaping surface of said one press member during said bending cycle.

3,960,536

ANTICHLOROSIS COMPOSITIONS FOR PLANTS

Louis Claude Dumont, Chaponost; René Antoine Paris, Lyon, and Claude Mathilde Scharff, Villeurbanne, all of France, assignors to PEPRO, Societe pour le Developpement et la Vente de Specialites Chimiques, Lyon, France

Filed Sept. 12, 1974, Ser. No. 505,510

Claims priority, application France, Sept. 25, 1973, 73.35083

Int. Cl.² C05C *13/00*

U.S. Cl. 71—1 **5 Claims**

1. Compositions suitable for use in controlling hypoferric chlorosis in plants, characterized in that they contain an effective quantity of at least one mixed chelate with at least two co-ordinates selected from the group consisting of

Co-ordinates	Molar ratios
[DHB] dihydro-2,4-benzoic acid: [EN] ethylene diamine: Fe	10:10:1
[DHB] dihydro-2,4-benzoic acid: dipicolic acid: Fe	5:2.5:1
[DHB] dihydro-2,4-benzoic acid: [NTA] nitrilo triacetic acid: Fe	2:2:1
[DHB] dihydro-2,4-benzoic acid: [NTA] nitrilo triacetic acid: Fe	10:10:1
[SSA] sulpho-5-salicylic acid: [EN] ethylene diamine: Fe	10:10:1
[SSA] sulpho-5-salicylic acid: dipicolic acid: Fe	10:5:1
Sodium pyrocatechol-3,5-disulphonate: [EDDA] ethylene diamine diacetic acid: Fe	1:2.4-1
Sodium pyrocatechol-3,5-disulphonate: [EDTA] ethylene diamine triacetic acid: Fe	1:1:1
Sodium pyrocatechol-3,5-disulphonate: [PAS] p-amino-salicylic acid: Fe	2:4:1
Sodium pyrocatechol-3,5-disulphonate: dipicolic acid: Fe	2:2:1
Sodium pyrocatechol-3,5-disulphonate: [EN] ethylene diamine: Fe	2:2:1
Sodium pyrocatechol-3,5-disulphonate: [NTA] nitrilo triacetic acid: Fe	1:2:1
Sodium pyrocatechol-3,5-disulphonate: tartaric acid: Fe	1:1:1
[NTA] nitrilo triacetic acid: dipicolic acid: Fe	2:2:1
[DHSN] Sodium dihydroxy naphthalene disulphonate: [NTA] nitrilo triacetic acid: Fe	2:2:1
[DHSN] Sodium dihydroxy naphthalene disulphonate: dipicolic acid: Fe	2:4:1
Sodium pyrocatechol-3,5-disulphonate: citric acid: Fe	1:1:1
[SSA] Sulpho-5-salicylic acid: citric acid: Fe	4:2:1

in which Fe represents iron in ionized form.

3,960,537

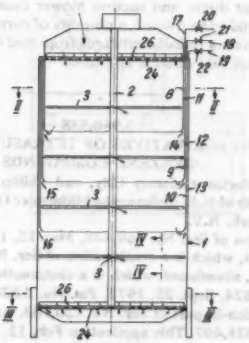
METHOD OF PROCESSING REFUSE AND/OR SLUDGE AND A PLANT FOR CARRYING OUT THE METHOD

Joseph Richard Kaelin, Villa Seeburg, CH-6374 Buochs, Switzerland

Filed Nov. 22, 1974, Ser. No. 526,227

Int. Cl.² C05F *11/08;* **F26B** *17/12;* **C05F** *9/04, 3/06*

U.S. Cl. 71—9 **9 Claims**



1. A biological conversion process for processing refuse or thickened sludge to form compost in a single continuous treatment chamber comprising the steps of:

filling the material to be treated from above into the top of said treatment chamber,

continuously permeating the material to be treated with a gas mixture to assist the biological conversion,

delivering the permeating gas mixture under elevated pressure into the material to be treated by means of a plurality of gas distributor blades vertically spaced apart from one another in the treatment chamber and covered by the material to be treated,

rotating the distributor blades about an axis which is parallel to the direction in which the material passes through the treatment chamber, each gas distributor blade being associated with at least one suction outlet for the gas current, said outlets being situated in the side wall of said single treatment chamber above and below said distributor blades,

exhausting said gas mixture by means of said suction outlets, and

discharging the treated material at the bottom of said treatment chamber,

whereby the material being treated is automatically passed in coherent form in the vertical direction from top to bottom through the single continuous treatment chamber and currents of gas mixture are formed in the material being treated and flow outwards in a radial direction from the gas distributor blades.

5. An apparatus for converting refuse or thickened sludge into compost by treatment with a gas, said apparatus comprising:

a treatment chamber for receiving material to be treated, said chamber having a vertical axis, an inlet aperture, and an outlet aperture, said material passing through said chamber from top to bottom,

a plurality of gas distributor blades mounted on a shaft in the treatment chamber for rotation about an axis which is parallel to the direction of material passage, said blades having gas outlet apertures connected to a pressure blower,

a plurality of hollow cylindrical exhaust ducts disposed concentrically to one another, the walls of said ducts forming a part of the side wall of said treatment chamber, each of said ducts having an axial length differing from the others extending from the top towards the bottom of said treatment chamber,

a plurality of annular exhaust apertures formed by the ends of said exhaust ducts, said apertures being directed towards the bottom of said treatment chamber and being spaced from one another in an axial direction, and

a suction blower connected to said exhaust apertures,

said pressure blower, distributor blades, exhaust apertures, exhaust ducts, and suction blower causing, through the material to be treated, a plurality of currents of treatment gas flowing radially outwards from said distributor blades towards said exhaust apertures.

3,960,538
AMINO DERIVATIVES OF TETRASUBSTITUTED BENZENE COMPOUNDS

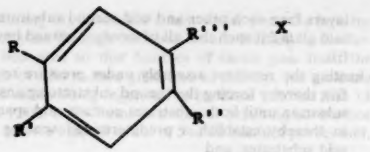
John J. Merianos, Jersey City, and Phillip Adams, Murray Hill, both of N.J., assignors to Millmaster Onyx Corporation, New York, N.Y.

Division of Ser. No. 360,448, May 15, 1974, Pat. No. 3,886,284, which is a continuation of Ser. No. 298,759, Oct. 18, 1972, abandoned, which is a continuation-in-part of Ser. No. 291,824, Sept. 25, 1972, Pat. No. 3,838,197, which is a continuation-in-part of Ser. No. 130,783, April 2, 1971, Pat. No. 3,821,407. This application Feb. 12, 1975, Ser. No. 549,170

Int. Cl.² A01N *9/20*

U.S. Cl. 71—67 **5 Claims**

1. A method of inhibiting algae which comprises applying to said algae an effective amount of a compound having the structure:



wherein R and R′ are either methyl, or a halogen when R‴ is —CH_2—; or R and R′, taken together, are methylene dioxy; R″ is either methyl or nitro; R‴ is either absent or is —CH_2— or —CH═; and X is the residue of a lower alkyl, mono- or polyamino, or alkanolamino radical.

3,960,539
LIMONENE DERIVATIVES USED IN GROWTH INHIBITION AND PLANT ABSCISSION PROCESSES

William F. Newhall, Winter Haven, Fla., assignor to Amchem Products, Inc., Ambler, Pa.

Division of Ser. No. 825,437, May 16, 1969, Pat. No. 3,564,046, which is a continuation-in-part of Ser. No. 604,622, Dec. 27, 1966, abandoned. This application Aug. 3, 1970, Ser. No. 60,717

Int. Cl.² A01N *9/24*

U.S. Cl. 71—76 **4 Claims**

1. A method of inhibiting plant growth and promoting fruit abscission which comprises applying to the locus to be treated a plant growth regulating amount of the quaternary ammonium compound (2,4-dichlorobenzyl) dimethyl (1-hydroxy-p-menth-2-yl) ammonium .X wherein X is an acid anion selected from the group consisting of halides, sulfates, phosphates, phosphonates, sulfonates and alkanoates of from 1 to 8 total carbon atoms.

3,960,540
GROWTH REGULATION IN LAWN CARE

Wayne Howard Crosby, Irvington, N.Y., assignor to General Foods Corporation, White Plains, N.Y.

Continuation-in-part of Ser. No. 265,077, June 21, 1972, abandoned, which is a continuation-in-part of Ser. No. 216,833, Jan. 10, 1972, abandoned. This application Dec. 23, 1974, Ser. No. 535,472

Int. Cl.² A01N *5/00*

U.S. Cl. 71—76 **3 Claims**

1. A composition of synergistically inhibiting the vertical growth of temperate turf grasses and concomitantly promoting the lateral growth of said grasses which consists essentially of a uniform blend of:

a. about 2 parts by weight of 3-trichloromethyl sulfonamido-p-acetotoluidide, and

b. about 3 parts by weight of 2-chloroethyl phosphonic acid, said blend incorporated in a quantity of inert carrier sufficient to effect dispersibility in application of the blend to said temperature turf grasses at a dosage level equivalent to about five pounds of blend of active ingredients per acre, said blend having no appreciable deleterious effect on the natural texture and appearance of said grasses.

3,960,541

PROCESS FOR REGULATING OR INFLUENCING THE GROWTH AND METABOLISM OF PLANTS

Hubert Mayr, Leonding near Linz; Elfriede Presoly; Ferdinand Weinrotter, both of Linz; Walter Müller, Leonding near Linz; Gerhard Stern, Linz, all of Austria, and Walter Mizzi Frohner, deceased, late of Pasching near Linz, Austria (by Maria Frohner), assignors to Chemie Linz Aktiengesellschaft, Austria

Division of Ser. No. 232,973, March 8, 1972, Pat. No. 3,877,923. This application Jan. 3, 1975, Ser. No. 539,434
Claims priority, application Austria, Mar. 8, 1971, 2000/71
Int. Cl.² A01N *9/28*
U.S. Cl. 71—88 10 Claims

1. A process for increasing the resistance of plants to drought, which comprises treating their seeds before sowing with an active compound selected from the group consisting of aliphatic epoxymonocarboxylic acids containing one to three epoxy groups and 6 to 22 carbon atoms and the salts, lower alkyl esters, lower polyhydroxyalkyl ester, amides, monoalkylamides and dialkylamides thereof.

5. A process for increasing the resistance of plants to drought, which comprises treating the surrounding soil, before or after emergence of the plants, with an active compound selected from the group consisting of aliphatic epoxymonocarboxylic acids containing one to three epoxy groups and 6 to 22 carbon atoms and the salts, lower alkyl esters, lower polyhydroxyalkyl ester, amides, monoalkylamides and dialkylamides thereof.

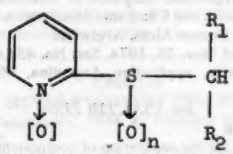
3,960,542

HERBICIDAL 2-SULFINYL AND 2-SULFONYL PYRIDINE N-OXIDE DERIVATIVES

Howard L. Plant, Milford, and Allyn R. Bell, Cheshire, both of Conn., assignors to Uniroyal Inc., New York, N.Y.

Filed Mar. 17, 1975, Ser. No. 559,196
Int. Cl.² A01N *17/08*
U.S. Cl. 71—94 16 Claims

1. A 2-sulfinyl or 2-sulfonyl pyridine N-oxide compound of the formula:



where

n is 1 or 2;

R_1 is hydrogen or methyl;

R_2 has one of the following values when R_1 is hydrogen; 2,2-dichlorocyclopropyl, 2,2-dichloro-1-methylcyclopropyl, cyano, naphthyl, methylnaphthyl, monosubstituted phenyl wherein the substituent is in the ortho position and is selected from alkyl having 1 to 2 carbon atoms, halogen, nitro, or polysubstituted phenyl having from 2 to 5 substituents which may be the same or different and are selected from alkyl having 1 or 2 carbon atoms, halogen, nitro, methoxy, ethyoxy and methylenedioxy; and

R_2 has one of the following values when R_1 is methyl: phenyl, naphthyl, or phenyl substituted with 1 to 3 substituents which may be the same or different and are selected from alkyl having 1 or 2 carbon atoms, halogen and nitro.

3,960,543

PROCESS OF PRODUCING SELF-SUPPORTING BRIQUETTES FOR USE IN METALLURGICAL PROCESSES

Paul Schmalfeld, Bad Homburg; Dieter Sauter, Frankfurt am Main, and Fred Erich Cappel, Sprendlingen, all of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany

Filed July 1, 1974, Ser. No. 485,050
Claims priority, application Germany, July 13, 1973, 2335669
Int. Cl.² C21B *1/08*
U.S. Cl. 75—3 12 Claims

1. Process for preparing self-supporting briquettes containing fine-grained metal oxide and caking coal for use in a metallurgical process to reduce said metal oxide which comprises the steps of:

a. forming a premixture of the fine-grained caking coal and tar pitch or petroleum bitumen having a temperature less than the temperature of the mixture to be briquetted formed in step (b), said tar pitch or petroleum bitumen being added in an amount of 2–20 percent by weight based on the mixture briquetted;

b. mixing the premixture from (a) with fine-grained materials containing metal oxide, said materials having a temperature in the range of 600°–900°C thereby forming a mixture to be briquetted having a temperature in the range of 350° to 550°C;

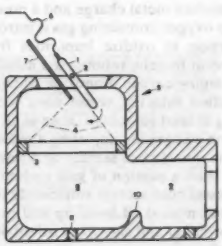
c. feeding said mixture to a briquetting press and forming briquettes from said mixture.

3,960,544

PROCESS FOR THE PRODUCTION OF IRON-CONTAINING TITANIFEROUS PARTICLES

Jozef Kazimierz Tylko, Faringdon, England, assignor to British Titan Limited, Billingham, England

Division of Ser. No. 407,810, Oct. 19, 1973, Pat. No. 3,853,536. This application July 12, 1974, Ser. No. 487,994
Claims priority, application United Kingdom, Nov. 29, 1972, 55049/72
Int. Cl.² C22B *1/08*
U.S. Cl. 75—3 14 Claims



1. Free-flowing, particulate material comprising iron-containing titaniferous particles coated with a carbonaceous, non-gaseous reductant and having an average particle size less than 500μ.

3,960,545
CERMET PLASMA FLAME SPRAY POWDER, METHOD FOR PRODUCING SAME AND ARTICLES PRODUCED THEREFROM

David J. Port, Athens; William D. Lafferty, and Richard F. Cheney, both of Towanda, all of Pa., assignors to GTE Sylvania Incorporated, Stamford, Conn.

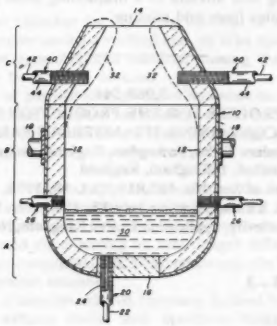
Filed Mar. 24, 1975, Ser. No. 561,638
Int. Cl.² B22F 9/00
U.S. Cl. 75—.5 R 9 Claims

1. A free flowing flame spray powder comprising agglomerates of powder particles, said agglomerates consisting essentially of subparticles of a metallic component selected from the group consisting of molybdenum and its alloys and from 1 to 50 weight percent of subparticles of an alumina component.

3,960,546
METHOD FOR ELIMINATING NOSE-SKULLS FROM STEELMAKING VESSELS

Franklin E. Rote, Peoria, Ill., and Karl Brotzmann, Sulzbach-Rosenberg, Germany, assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed May 22, 1974, Ser. No. 472,245
Int. Cl.² C21C 5/32, 5/34
U.S. Cl. 75—60 28 Claims



1. In a metal refining vessel having a hearth section to contain a molten metal charge and a nose section thereabove, wherein an oxygen containing gas is introduced into the vessel hearth section to oxidize impurities from a molten metal charge therein thereby refining the metal charge and forming gases containing carbon monoxide which pass from the vessel hearth section into the vessel nose section; the method of eliminating at least substantial nose-skull build-up in the vessel nose section comprising, injecting a second oxygen containing gas into the vessel nose section at a rate sufficient to therein oxidize at least a portion of said carbon monoxide gases and heat the vessel nose section sufficiently to melt any significant accumulated nose-skull build-up and prevent further molten particles of metal and slag from solidifying on the vessel nose section walls.

3,960,547
STEELMAKING PROCESS

James W. Kirkpatrick, Poland Township, Mahoning County; W. Fergus Porter, Poland, and William E. Shepherd, Youngstown, all of Ohio, assignors to Youngstown Sheet and Tube Company, Youngstown, Ohio

Filed Dec. 18, 1972, Ser. No. 316,294
Int. Cl.² C21C 7/00
U.S. Cl. 75—60 4 Claims

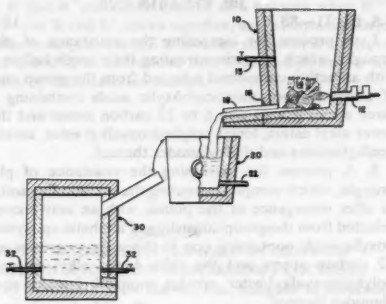
1. A process for producing refined steel which comprises:

a. providing a supply of molten iron bearing material, having a composition comprising, in percent by weight:

.5 – 2.0	Silicon
2.0 min.	Carbon
.4 – 1.5	Manganese

and the balance being essentially iron

b. adding, to said molten iron, molten steel having a carbon content less than 2%, by weight, to provide a molten mix comprising 40–75% molten steel and 60–25% molten iron;



c. adding, to said molten mix, unmolten iron bearing material in an amount where the unmolten material comprises approximately 5–15%, by weight, of the resultant mixture comprised of said molten mix and the added unmolten material; and

d. blowing essentially pure oxygen through the resultant mixture to refine the same.

3,960,548
PROCESS FOR THE SEPARATION OF COMPONENTS IN MULTICOMPONENT MIXTURES, FOR THE CASE WHEREIN THE DIAGRAM OF BINARY PHASES OF THE TWO MAJOR COMPONENTS PRESENTS A MONOTECTIC AND THEIR DENSITIES ARE DIFFERENT

Conrado F. Varotto; Miguel Angel Audero; Daniel I. Vasallo; Roberto Pascual, and Hector J. Ruffo, all of San Carlos de Bariloche, Argentina, assignors to Comision Nacional de Energia Atomica and Compania Metalurgica Austral Argentina, both of Buenos Aires, Argentina

Filed Mar. 25, 1974, Ser. No. 454,696
Claims priority, application Argentina, Mar. 27, 1973, 247269
Int. Cl.² C22B 13/06
U.S. Cl. 75—78 7 Claims

1. A process for the separation of components in multicomponent mixtures, for the case where the diagram of binary phases of the two major components to be separated presents a monotectic and their densities are different, said process comprising the steps of (a) melting the mixture and heating it to a temperature above the temperature of the monotectic and/or of the solid/liquid transformation depending on the composition of the mixture; (b) cooling the mixture from the maximum temperature, controlling the rate of cooling until a temperature about that of the temperature of the monotectic transformation is reached; (c) maintaining the mixture at the temperature of the monotectic transformation for a preestablished period of time; (d) cooling the mixture down to a temperature below the temperature of the monotectic transformation the cooling being made at a controlled rate; (e) heating the material from the lower temperature reached, up to the temperature of the monotectic transformation controlling the heating rate; (f) maintaining the mixture at the temperature of the monotectic for a preestablished period of time; (g) heating

the mixture up to a maximum temperature, above the temperature of the monotectic and/or of the solid/liquid transformation depending on the composition of the mixture, the heating being conducted at a controlled rate, wherein the new higher maximum temperature may be higher, the same or lower than the maximum starting temperature; and (h) separating from said mixture liquid rich in said denser component.

3,960,549

PROCESS FOR THE SEPARATION AND PURIFICATION OF PLATINUM, RHODIUM AND IRIDIUM

John James MacGregor, London, England, assignor to Matthey Rustenburg Refiners (Proprietary), Limited, Johannesburg, South Africa

Filed Dec. 3, 1974, Ser. No. 529,245

Claims priority, application United Kingdom, Dec. 7, 1973, 56826/73

Int. Cl.² C22B *11/04*; C01G *55/00*

U.S. Cl. 75—108 **49 Claims**

1. A process for the separation and purification of platinum, rhodium and iridium present as salts dissolved in aqueous solution comprising the steps of:

a. contacting the solution at acid pH with a reducing agent to effect the reduction of iridium present as Ir(IV) to Ir(III);

b. contacting the reduced solution with a nitrogen containing organic compound selected from the group consisting of secondary amines of the formula R_2NH, tertiary amines of the formula R_3N and quaternary ammonium compounds of the formula R_4NX wherein at least one R is an alkyl group, the remainder being alkyl or aryl, and X is a halide or hydroxide ion;

c. removing from contact with the solution an organic phase containing substantially all of the platinum present in association with the nitrogen-containing organic compound used in step (b);

d. re-oxidising iridium which with the rhodium remains in the aqueous phase from Ir(III) to Ir(IV);

e. again contacting the oxidised solution with a fresh quantity of a nitrogen-containing organic compound selected from the group consisting of secondary amines of the formula R_2NH, tertiary amines of the formula R_3N and quaternary ammonium compounds of the formula R_4NX wherein at least one R is an alkyl group, the remainder being alkyl or aryl, and X is a halide or hydroxide ion;

f. removing from contact with the reoxidised solution the organic phase containing substantially all of the iridium present in association with the nitrogen-containing organic compound used in step (e).

3,960,550

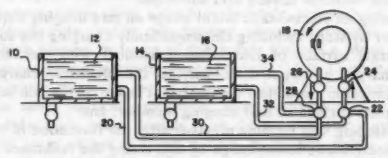
SILVER RECOVERY PROCESS

William L. Dusenberry, 7046 E. Paradise Drive, Scottsdale, Ariz. 85218

Filed Feb. 24, 1975, Ser. No. 552,411

Int. Cl.² C22B *11/04*

U.S. Cl. 75—118 P **14 Claims**



1. A method for reclaiming silver from photographic substrates; comprising: immersing and washing silver emulsion coated substrates in a dilute solution of sodium hypochlorite until the silver bearing emulsion is removed from said substrates and disposed in said solution; then introducing sodium hydroxide into said solution to precipitate said silver into a lower strata of said solution and introducing a flocculating agent into said solution and allowing said silver to settle to said lower strata in the form of sludge in said solution; then removing the diluted solution from an area above said lower strata; then placing the silver sludge from said lower strata into fabric bags wherein the flocculating agent tends to retain the silver sludge in the bags and allows the remainder of said solution to drain from the silver sludge until a substantial amount of moisture has escaped from the sludge and it is in a partially dried condition; and then placing the partially dried sludge in containers and thus subjecting it to a baking process until the sludge is in a dried cake condition.

3,960,551

ALUMINIUM BASED ALLOY

Iosif Naumovich Fridlyander, Volokolamskoe shosse, 15/22, kv. 66, Moscow; Konstantin Petrovich Yatsenko, 15 Parkovaya ulitsa, 44, kv. 47, Moscow; Galina Anatolievna Nekrasova, 1 Mosfilmovsky pereulok, 14, kv. 76, Moscow; Alexandr Nikolaevich Gulin, Belovezhskaya ulitsa, 31, kv. 32, Moscow; Zoya Grigorievna Semenova, B. Cherkizovskaya ulitsa, 5, korpus 4, kv. 8, Moscow; Nikolai Grigorievich Sidorov, prospekt Koroleva, 1, kv. 150, Kaliningrad Moskovskoi oblasti; Boris Sergeevich Morozov, ulitsa Tikhomirova, 1, kv. 12, Moscow; Efrem Julievich Krichevsky, ulitsa Borisa Galushkina, 17, kv. 280, Moscow; Tatyana Alexandrovna Zakharova, Shmitovsky Proezd, 13, kv. 34, Moscow, and Raisa Grigorievna Sarycheva, B. Cherkizovskaya ulitsa, 8, korpus 11, kv. 70, Moscow, all of U.S.S.R.

Filed Oct. 21, 1974, Ser. No. 516,874

Int. Cl.² C22C *21/06*

U.S. Cl. 75—147 **1 Claim**

1. An alloy consisting essentially of between 9.5 and 30 wt % of beryllium, between 0.5 and 10.0 wt % of magnesium, between 0.05 and 0.5 wt % of titanium, between 0.05 and 0.5 wt % of zirconium, the balance being aluminium.

3,960,552

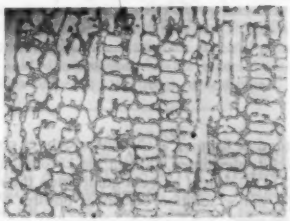
COBALT ALLOY

Michael J. Woulds, 1200 E. Ocean Blvd., Long Beach, Calif. 90802

Filed Oct. 21, 1974, Ser. No. 516,649

Int. Cl.² C22C *19/07*

U.S. Cl. 75—171 **8 Claims**



1. A cobalt-base alloy free of zirconium as an alloy element and consisting essentially of from 20 to 27 percent chromium, 9 to 11 percent nickel, 6 to 8 percent tungsten, 2.5 to 4.5 percent tantalum, 0.2 to 0.6 percent titanium, 0.5 to 0.7 percent carbon, 0.25 to 3.0 percent aluminum and the balance being cobalt, said aluminum being present in the aforesaid amount, sufficient to impart improved strength chracteristics to said alloy.

3,960,553

ELECTRICAL CONTACT MATERIALS AND METHODS OF MAKING THE SAME

Terrence Ardern Davies, Horton, England, assignor to Square D Company, Park Ridge, Ill.

Division of Ser. No. 384,157, July 30, 1973, Pat. No. 3,857,706. This application Nov. 25, 1974, Ser. No. 526,762
Claims priority, application United Kingdom, Aug. 25, 1972, 39666/72
Int. Cl.² C22C 5/06
U.S. Cl. 75—173 R 1 Claim

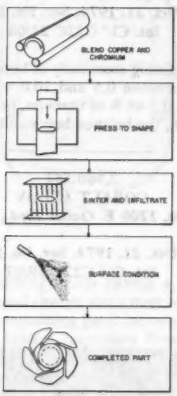
1. A method of producing an electrical contact material including the steps of providing a silver-mercury master alloy of a desired composition; adding the master alloy to molten silver under an inert atmosphere to provide a silver-based molten alloy having a mercury concentration of not more than 3.0 weight per cent; and casting the molten alloy to form an ingot.

3,960,554

POWDERED METALLURGICAL PROCESS FOR FORMING VACUUM INTERRUPTER CONTACTS

Robert E. Gainer, Jr., Monroeville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 3, 1974, Ser. No. 476,177
Int. Cl.² B22F 3/00, 1/00, 1/02, 1/04
U.S. Cl. 75—200 7 Claims



1. A method of forming a chromium copper contact for a vacuum circuit interrupter wherein the chromium content is between 40 to 60 weight percent comprising the steps of:

blending a minor addition of copper powder with a chromium powder;

pressing the blended powder in a die with a pressure of less than 20 tons per square inch to the shape desired, so that the desired chromium porosity is produced in the compact whereby the chromium content of the finished contact is between 40 to 60 weight percent;

removing the pressed compact shape from the die;

vacuum sintering for a predetermined time to form a porous chromium matrix which is preferably infiltrated with the minor addition of copper; and

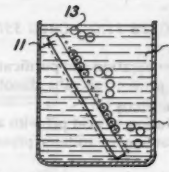
final sintering and fully infiltrating the chromium matrix with copper to fill the chromium matrix.

3,960,555

PHOTOGRAPHIC CHARGING AND IMAGING PROCESS

William L. Goffe, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 460,377, June 1, 1965, Pat. No. 3,908,177, which is a continuation-in-part of Ser. No. 403,002, Oct. 12, 1964, abandoned. This application Apr. 3, 1967, Ser. No. 628,029
The portion of the term of this patent subsequent to July 14, 1987, has been disclaimed.
Int. Cl.² G03G 5/04
U.S. Cl. 96—1 PS 17 Claims



1. An imaging method comprising:

providing an imaging member comprising a dielectric substrate, an overlayer of substantially electrically insulating softenable material and a fracturable layer of particulate material embedded at the surface of the softenable overlayer spaced apart from the substrate, said softenable material capable of having its resistance to migration of said particulate material decreased sufficiently to allow migration of the particulate material through the softenable material toward said substrate,

placing the dielectric substrate of said member in contact with an electrical ground,

forming an electrostatic latent image on said member,

developing said imaging member after the forming of the electrostatic latent image by decreasing the resistance of the softenable material to migration of the particulate material at least sufficient to allow migration of the particulate material through the softenable material whereby selected portions of the particulate material migrate in image configuration toward said substrate.

10. An imaging method comprising:

providing an imaging member comprising a dielectric substrate, an overlayer of substantially electrically insulating softenable material and a fracturable layer of particulate material embedded at the surface of the softenable overlayer spaced apart from the substrate, said softenable material capable of having its resistance to migration of said particulate material decreased sufficiently to allow migration of the particulate material through the softenable material toward said substrate,

forming an electrostatic latent image on said imaging member by steps including electrostatically charging the substrate surface of said imaging member with electrical charges of opposite polarity to the electrical charges comprising said electrostatic latent image on the non-substrate surface of said imaging member; and

developing said imaging member after the formation of the electrostatic latent image by decreasing the resistance of the softenable material to migration of the particulate material at least sufficient to allow migration of the particulate material through the softenable material whereby selected portions of the particulate material migrate in image configuration toward said substrate.

3,960,556

CONSTANT CURRENT TONER TRANSFER

Jerome J. Griesmer, Mentor, Ohio, assignor to Addressograph Multigraph Corporation, Cleveland, Ohio

Filed Mar. 1, 1973, Ser. No. 336,993
Int. Cl.² G03G 13/14
U.S. Cl. 96—1.4 2 Claims

1. The method of electrostatic printing by transferring an image of electrically charged particles between an original support and a transfer support, comprising:

developing a latent image on a surface of said original support by means of toner particles;

bringing a surface of said transfer support into virtual contact with the developed image; and

applying a source of charge migration to all areas of said surface of the transfer support by bringing said surface to an electric potential resulting in a substantially uniform current density value,

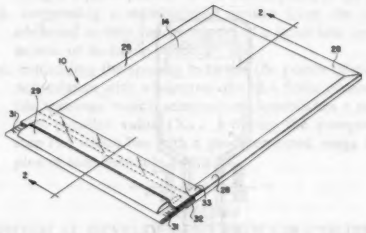
whereby the developed image on said surface of the original support is caused to be transferred to said surface of the transfer support.

3,960,557

POLYDISPERSED SILVER HALIDE EMULSIONS WITH IODIDE FOR USE IN DIFFUSION TRANSFER

William J. Timson, Belmont, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Nov. 3, 1972, Ser. No. 303,474
The portion of the term of this patent subsequent to Oct. 10, 1989, has been disclaimed.
Int. Cl.² G03C 7/00, 5/54, 1/48, 1/10
U.S. Cl. 96—3 25 Claims



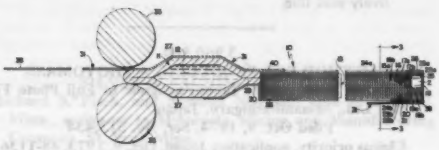
1. A photographic diffusion transfer color process film unit which comprises a plurality of layers including a photosensitive layer comprising a particulate dispersion of polydisperse photosensitive silver iodochlorobromide polydisperse, silver iodochloride and/or polydisperse silver iodobromide grains which possess in terms of the iodide thereof a mean iodide concentration within the range of about 0.5 to 15 mole %, and in which dispersion not in excess of about 20%, by weight, of the silver iodochlorobromide, silver iodochloride or silver iodobromide grains deviate from the mean iodide concentration by in excess of about ± 25%, by weight, iodide, having associated therewith diffusion transfer process dye image-forming material and a layer adapted to receive diffusion transfer process dye image-forming material diffusing thereto as a function of the point-to-point degree of said photosensitive layer's exposure to incident actinic radiation.

3,960,558

DYE FREE, SPECTRALLY SENSITIVE SILVER HALIDE LAYERS IN DIFFUSION TRANSFER FILMS

Paul A. Cardone, Framingham, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Apr. 29, 1974, Ser. No. 464,818
Int. Cl.² G03C 7/00, 1/40, 5/54, 3/00
U.S. Cl. 96—3 34 Claims



1. A composite photographic diffusion transfer process film unit which comprises a plurality of sequential layers including, in combination, a first dimentionally stable transparent layer; a first dyeable layer adapted to receive diffusion transfer process dye image-forming material diffusing thereto; an opaque layer; a first photosensitive silver halide layer comprising a dispersion of silver halide grains possessing a first mean particle size, having associated therewith a diffusion transfer process dye image-forming material possessing spectral absorption within the spectral range to which the silver halide grains are sensitive; a second photosensitive silver halide layer substantially free of diffusion transfer process dye image-forming material comprising a dispersion of silver halide grains possessing a second mean particle size and substantially spectrally sensitive within said spectral range; said second mean particle size being less than said first particle size; a second dimensionally stable transparent layer; means for providing a processing composition intermediate the second dimensionally stable transparent layer and the next adjacent silver halide layer; means for providing opacifying agent intermediate the second dimensionally stable layer and the next adjacent silver halide layer in a quantity effective to prevent exposure of the photosensitive silver halide layers during processing of the film unit in the presence of radiation actinic to the photosensitive layers and incident on said second dimensionally stable transparent layer and the opaque layer is effective to prevent exposure of said photosensitive layers during processing of said film unit in the presence of radiation actinic to the photosensitive layer and incident on said first dimensionally stable layer; means for maintaining the composite unit intact subsequent to diffusion transfer processing; said second silver halide layer possessing a sensitivity to incident radiation at wavelengths to which it has been sensitized greater than the sensitivity exhibited by said first photosensitive silver halide layer to said radiation at said wavelengths; said layers arranged in substantially parallel planar relationship; and said dimensionally stable layers being externally disposed with respect to the other of said layers.

3,960,559

METHOD OF MAKING A SEMICONDUCTOR DEVICE UTILIZING A LIGHT-SENSITIVE ETCHING AGENT

Gyoji Suzuki; Masayoshi Nagata; Takeshi Tomotsu, and Hisatake Ono, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Oct. 16, 1973, Ser. No. 406,986
Claims priority, application Japan, Oct. 19, 1972, 47-104751
Int. Cl.² C09K 13/08
U.S. Cl. 96—36 14 Claims

1. A method of making a semiconductor device, which comprises

applying to a silicon containing film provided on a semiconductor substrate a light-sensitive etching agent comprising (a) a photodecomposable compound forming upon

decomposition a material capable of etching said film in presence of water, (b) a material capable of forming water upon irradiation with light, (c) a binder inert to compounds (a), (b) and (d) and (d) a solvent inert to components (a) and (b), and then image-wise exposing said light sensitive etching agent to irradiation capable of decomposing said photodecomposable compound and said material capable of forming water to thereby selectively said film.

3,960,560

METHOD FOR PRODUCING A PHOTOMASK

Masamichi Sato, Asaka, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Oct. 9, 1974, Ser. No. 513,434

Claims priority, application Japan, Oct. 9, 1973, 48-113631

Int. Cl.[2] G03C *5/00;* **C09K** *13/08;* **G03B** *27/00;* **G03C** *11/00*

U.S. Cl. 96—36 **15 Claims**

1. A method for producing a photomask, which comprises exposing and development-processing a photographic material comprising a transparent support having thereon a masking layer and a silver halide emulsion layer to thereby form a silver image, etch-bleaching said silver halide emulsion layer to thereby remove the silver image areas, baking the remaining non-silver image areas to thereby decompose the binder contained therein, to prevent being swollen, dissolved or penetrated by an etching solution which would otherwise swell, dissolve or pentrate the unbaked binder, subjecting the support, masking layer and decomposed binder to said etching solution to thereby remove the masking layer located at the areas corresponding to the silver image, and removing the decomposed binder to thereby uncover the masking layer at the areas corresponding to the non-silver image areas.

3,960,561

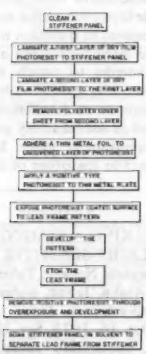
METHOD FOR MAKING ELECTRICAL LEAD FRAME DEVICES

Frank W. Haining, Binghamton; Joseph M. Kolly, and Thomas E. Lynch, Jr., both of Vestal, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 10, 1975, Ser. No. 566,856

Int. Cl.[2] H05K *1/00*

U.S. Cl. 96—36.2 **7 Claims**


CLEAN A STIFFENER PANEL
LAMINATE A FIRST LAYER OF DRY FILM PHOTORESIST TO STIFFENER PANEL
LAMINATE A SECOND LAYER OF DRY FILM PHOTORESIST TO THE FIRST LAYER
REMOVE POLYESTER COVER SHEET FROM SECOND LAYER
ADHERE A THIN METAL FOIL TO UNCOVERED LAYER OF PHOTORESIST
APPLY A POSITIVE TYPE PHOTORESIST TO THIN METAL FOIL
EXPOSE PHOTORESIST COATED SURFACE TO LEAD FRAME PATTERN
DEVELOP THE PATTERN
ETCH THE LEAD FRAME
REMOVE POSITIVE PHOTORESIST THROUGH OVEREXPOSURE AND DEVELOPMENT
SOAK STIFFENER PANEL IN SOLVENT TO SEPARATE LEAD FRAME FROM STIFFENER

5. A method for making thin lead frame devices with land areas thereon comprising the steps of:

a. cleaning a stiffener panel,

b. laminating a first layer of dry film photoresist having a polyester cover sheet thereon to one side of the stiffener panel,

c. laminating a second layer of dry film photoresist having a polyester cover sheet thereon on said first layer of dry film photoresist,

d. removing the polyester cover sheet from the second layer of dry film photoresist,

e. adhering a thin metal foil to the uncovered second layer of dry film photoresist,

f. applying a positive type photoresist to the thin metal foil,

g. exposing the photoresist coated surface to a lead frame etch pattern,

h. developing the exposed pattern,

i. etching the lead frame to remove the positive photoresist by overexposing the surface minus a pattern and developing same,

j. applying a negative photoresist to the surface,

k. exposing to a land area plating pattern,

l. developing the land area plating pattern,

m. plating up metallic composition according to the plating pattern to develop lands at the lead frame ends, and

n. soaking the stiffener panel assembly in solvent to remove the lead frame from the stiffener panel.

3,960,562

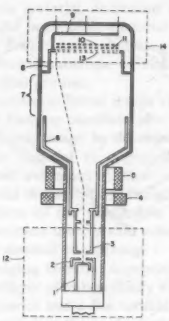
THIN FILM DIELECTRIC STORAGE TARGET AND METHOD FOR MAKING SAME

Wolfgang M. Feist, Burlington, Mass., assignor to Raytheon Company, Lexington, Mass.

Division of Ser. No. 355,855, April 30, 1973, which is a division of Ser. No. 208,494, Dec. 15, 1971, abandoned, which is a division of Ser. No. 210,095, Dec. 20, 1971, abandoned, which is a continuation of Ser. No. 12,566, Feb. 19, 1970, abandoned, and a continuation-in-part of Ser. No. 806,534, March 12, 1969, abandoned. This application Nov. 27, 1973, Ser. No. 419,302

Int. Cl.[2] H01J *31/48*

U.S. Cl. 96—38 **7 Claims**



5. A method for fabricating a dielectric storage target comprising the steps of:

coating a non-reactive conductive metal mesh with a lacquer layer;

depositing a thin substantially transparent refractory dielectric film on said lacquer layer;

evaporating the lacquer layer by applying heat to the film covered mesh;

immersing the film covered mesh in a plating solution preferably of copper or gold; and

applying a negative potential to the mesh whereby the plating material exudes through the pre-existing fine cracks and pores in the dielectric film in the area of the mesh wires.

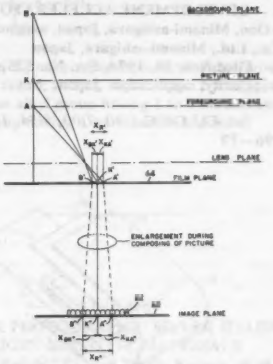
3,960,563
METHODS AND APPARATUS FOR TAKING AND COMPOSING STEREOSCOPIC PICTURES

Allen Kwok Wah Lo, Atlanta, and Jerry Curtis Nims, Dunwoody, both of Ga., assignors to Dimensional Development Corporation, Atlanta, Ga.

Continuation-in-part of Ser. No. 398,990, Sept. 20, 1973, abandoned, which is a continuation-in-part of Ser. No. 292,796, Sept. 27, 1972, abandoned. This application Sept. 24, 1974, Ser. No. 508,810

Int. Cl.² G03C *9/00*

U.S. Cl. 96—40 **31 Claims**



1. The method of producing a stereoscopic picture which comprises the steps of:

a. sequentially photographing a scene with a single camera at a series of substantially equidistantly spaced points lying in a plane parallel to the object plane of the scene;

b. composing a stereoscopic picture from the negatives obtained in step (a) by means of a lenticular composing screen of lenticule width W; and

c. controlling the spacing between the points of step (a) in accordance with a selected one of a finite number possible spacings, which selected one establishes a maximum total parallax value ($X_{T\,n}$) during the composition of step (b) which lies with a predetermined range of multiples of said lenticule width W.

3,960,564
PHYSICAL DEVELOPMENT PROCESS UTILIZING A PHYSICAL DEVELOPER CONTAINING A SPECIFIC REDUCING AGENT, A THIOL COMPOUND

Arian Molenaar, and Hendrik Jonker, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 369,750, June 13, 1973. This application Oct. 24, 1974, Ser. No. 517,782

Claims priority, application Netherlands, June 21, 1972, 7208453

Int. Cl.² G03C *5/24*

U.S. Cl. 96—48 PD **2 Claims**

1. In the method of producing a carrier with a silver coating by first providing physically developable metal nuclei image produced by selective exposure of a photo-sensitive layer on a carrier and then physically developing said metal nuclei image with an aqueous solution of a silver salt an a reducing agent therefor, the improvement where after formation of the metal nuclei image the carrier is rinsed with a solution comprising ammonium hydroxide or a soluble pyrophosphate and the carrier is then treated with an electroless silver plating composition comprising an aqueous solution of a silver salt, ammonium hydroxide as a complexing compound for silver ions, a reducing agent selected from the group consisting of soluble tartrates, formaldehyde and hydrazine and in addition an organic compound containing at least one —SH group and at least one cyclic or polar aliphatic group in a concentration of between 10^{-7} and 10^{-2} mol/liter.

3,960,565
SILVER BLEACHING SOLUTIONS

Richard S. Fisch, and Norman Newman, both of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Nov. 12, 1973, Ser. No. 414,890

Int. Cl.² G03C *5/32, 7/00;* **C22B** *11/00*

U.S. Cl. 96—60 R **16 Claims**

1. An aqueous non-fixing, ferricyanide free, oxidizing solution comprising

1. at least one water-soluble ferric compound which makes ferric ion available for the oxidation of silver,

2. halide ion, and

3. at least one water-soluble compound which releases an inorganic ion in aqueous solution which raises the redox potential of the solution comprising (1) and (2) at constant pH by at least 50 millivolts when present in a concentration not exceeding 50 g/liter, said water-soluble compound which releases an inorganic ion being selected from the class of chlorates, persulfates, perchlorates, iodates, periodates and hypochlorates.

3,960,566
METHOD FOR DRY STABILIZATION OF SILVER HALIDE PHOTOGRAPHIC MATERIAL

Shinpei Ikenoue, and Takao Masuda, both of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Dec. 6, 1973, Ser. No. 422,387

Claims priority, application Japan, Dec. 8, 1972, 47-123212

Int. Cl.² G03C *5/38*

U.S. Cl. 96—61 R **12 Claims**

1. A method for stabilizing a silver halide photographic print out material in the dry state, which material contains an organic compound having an iodine atom connected to a carbon atom and which is capable of releasing an iodine atom or iodine ion when heated to a temperature of at least 80°C, said organic compound being a member selected from the group consisting of compounds having the following formula (I)

(I)

wherein each of R_1, R_2 and R_3 is a hydrogen atom, an alkyl group, an alkenyl group, an alkynyl group, an aryl group, a halogen atom, an acylalkoxy group, a carboxy group, a nitro group, an amino group, a substituted amino group, formyl group, an oxo group, a cyano group, or a mercapto group, said alkyl, alkenyl, alkynyl and aryl groups being either unsubstituted or substituted with a substituent selected from the group consisting of a halogen atom, a nitro group, an amino group, a formyl group, a carbonyl group, a cyano group, a mercapto group, an acyl group, and an alkoxy group, and compounds expressed by the following formula (II) I)

(II)

wherein Z is C, O, N, S, or Se and forms a 5- or 6-membered unsubstituted or substituted ring, said substituents being selected from the group consisting of alkyl groups, alkenyl groups, aryl groups, halogen atoms, acyl groups, alkoxy groups, aralkyl groups, carboxy groups, nitro groups, substituted amino groups, amino groups, formyl groups, carbonyl groups, cyano groups and oxo groups; said method comprising forming a print-out image on said material by exposure to actinic radiation and then heating said material to a temperature of at least 80°C.

3,960,567

PROCESS AND COMPOSITION FOR PRODUCING PHOTOLITHOGRAPHIC PLATE FOR THE GRAPHIC ARTS

Katsumi Hayashi, Minami-ashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Continuation of Ser. No. 281,094, Aug. 16, 1972, abandoned. This application Oct. 7, 1974, Ser. No. 512,658

Claims priority, application Japan, Aug. 21, 1971, 46-63928

Int. Cl.² G03C *5/30*

U.S. Cl. 96—66.5 **9 Claims**

1. In a process for producing a photolithographic plate for the graphic arts which comprises imagewise exposing and then developing a silver halide photographic material with an infectious developer composition having a pH higher than 8 and comprising (a) at least one member selected from the group consisting of hydroquinone and hydroquinone derivatives wherein said at least one member is the sole developing agent in said infectious developer composition, (b) an aldehyde-bisulfite addition product, (c) an alkai agent and (d) free sulfite ions, the improvement which comprises including a viscosity increasing agent selected from the group consisting of carboxymethyl cellulose, hydroxyethyl cellulose, sodium alginate, methyl cellulose, polyvinyl alcohol and methylvinyl ether-maleic anhydride copolymer; said developer composition having a viscosity of from about 1,000 to 200,000 centipoises at 25°C.

3,960,568

PHOTOGRAPHIC MATERIAL CONTAINING FINE SILVER HALIDE PARTICLES AND HYDROXYLAMINO SUBSTITUTED TRIAZINE OR PYRIMIDINE SENSITIZERS

Tohru Sueyoshi; Yoshiyuki Nakazawa; Yoshuhara Nakamura; Reiichi Ohi, and Tokiharu Kondo, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Nov. 18, 1975, Ser. No. 524,859

Claims priority, application Japan, July 17, 1971, 46-53318

Int. Cl.² G03C *1/48, 1/28, 1/40, 1/02*

U.S. Cl. 96—76 R **18 Claims**

1. A silver halide photographic material comprising a support having thereon at least one photographic emulsion layer comprising silver halide particles having an average particle diameter not in excess of 0.35 micron or in which at least 90% of the total particles have a particle diameter not in excess of 0.4 micron, or having thereon at least one of said silver halide emulsion layers and at least one photographic emulsion layer comprising a hydrophilic polymeric material, wherein at least one of said photographic emulsion layers or said emulsion layer of a hydrophilic polymeric material contains a sensitizing amount of a heterocyclic organic compound represented by the formula (I):

wherein X represents a nitrogen atom or a methine group and Z represents an atomic group necessary for forming a triazine ring which is part of a fused ring system, a pyrimidine ring or a pyrimidine ring which is part of a fused ring system.

3,960,569

DIFFUSION TRANSFER COLOR FILM UNIT WITH HYDROXY SUBSTITUTED ALKYLENE AMINO DEVELOPMENT ACCELERATORS

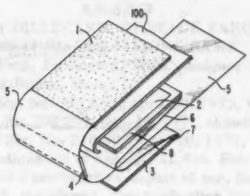
Yoshiaki Ono, Minami-ashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Nov. 20, 1974, Ser. No. 525,431

Claims priority, application Japan, Nov. 20, 1973, 48-130379

Int. Cl.² G03C *1/40, 7/00, 5/54, 1/48*

U.S. Cl. 96—77 **27 Claims**



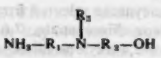
1. A diffusion transfer color film unit for the dissolution-physical development system,

A. which comprises:

1. a light-sensitive element comprising a support having thereon at least one light-sensitive layer unit comprising
   i. a negative-type light-sensitive silver halide emulsion layer containing a ballasted compound capable of reacting with an oxidation product of an aromatic primary amino color developing agent to provide a non-diffusible compound and
   ii. an adjacent layer containing physical development nuclei and a ballasted coupler capable of reacting with an oxidation product of an aromatic primary amino color developing agent to provide a diffusible dye;
2. an image-receiving element comprising a support having thereon an image-receiving layer capable of fixing diffusible dyes released from the light-sensitive element;
3. a rupturable container which retains an alkaline processing composition and which is capable of releasing an alkaline processing composition by the action of pressure-applying members for spreading between the light-sensitive element and the image-receiving element; and
4. an aromatic primary amino color developing agent in the processing composition or a precursor thereof which provides, upon hyrolysis with the processing composition, said developing agent in the light-sensitive element, and a solvent for silver halide, and

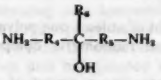
B. which is adapted to be processed, after imagewise exposure of said light-sensitive element, by spreading the processing composition as a layer between the light-sensitive element and the image-receiving element through the action of pressure-applying members,

said diffusion transfer color film unit containing at least one compound represented by the following general formula (I)



(I)

wherein R_1 and R_2 each represents an alkylene group having 1 to 4 carbon atoms; and R_3 represents a hydrogen atom, an amino group, an alkyl group having 1 to 4 carbon atoms or an aminoalkyl group having 1 to 4 carbon atoms; or represented by the following general formula (II)



(II)

wherein R_4 and R_5 each represents an alkylene group having 1 to 4 carbon atoms; and R_6 represents a hydrogen atom, an amino group, an alkyl group having 1 to 4 carbon atoms or an aminoalkyl group having 1 to 4 carbon atoms.

3,960,570

COLOR PHOTOGRAPHIC SILVER HALIDE LIGHT-SENSITIVE MATERIALS

Yasushi Oishi; Reiichi Ohi, and Yoshio Kosuge, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

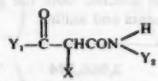
Filed Feb. 11, 1974, Ser. No. 441,522

Claims priority, application Japan, Feb. 9, 1973, 48-16255

Int. Cl.² G03C *1/40*

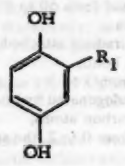
U.S. Cl. 96—100 **17 Claims**

1. A color photographic silver halide light-sensitive material comprising a support having coated thereon at least one hydrophilic colloid silver halide emulsion layer containing a non-diffusible alpha-acylacetoamide dye-forming coupler represented by the forumula (II):



wherein Y_1 is an aliphatic group, an aromatic group or a heterocyclic group, Y_2 is an aromatic group or a heterocyclic group and X is a member selected from the group consisting of a fluorine atom, an acyloxy group, an aryloxy group, a heterocyclic oxy group, a cyclic acylamino group or a cyclic acysulfonylamino group,

said emulsion layer or a hydrophillic colloid layer adjacent thereto containing a monoalkylhydroquinone represented by formula (I) or a compound capable of releasing said monoalkylhydroquinone by hydrolysis in aqueous alkaline solution:



(I)

wherein R_1 is an alkyl group having at least 4 carbon atoms.

3,960,571

SILVER HALIDE COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Akio Okumura; Yukio Yokota; Kozo Inouye; Keisuke Shiba, and Minoru Yamada, all of Minami-ashigara, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

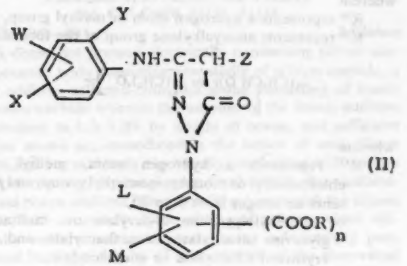
Filed Sept. 27, 1974, Ser. No. 509,889

Claims priority, application Japan, Sept. 27, 1973, 48-108798

Int. Cl.² G03C *1/40*

U.S. Cl. 96—100 **9 Claims**

1. A color photographic light-sensitive material having a silver halide emulsion layer containing a magenta color-forming coupler represented by the general formula (II)



(II)

wherein n represents 1 or 2, R represents a straight-chain or branched chain alkyl group, an alkenyl group or an aralkyl group and when n is 1, R has about 8 to 26 carbon atoms and when n is 2, each R group has about 4 to 18 carbon atoms; L and M each represent a hydrogen atom, a halogen atom, an alkyl group, an alkoxy group, a cyano group, a hydroxy group, an amido group or a carboxy group; Z represents a hydrogen atom or a group which is released on coupling with the oxidation product of an aromatic primary amino color developing agent; W, X and Y each represent an alkyl group, an aryl group, an alkoxy group, an aryloxy group, an alkylthio group, an amino group, an amido group, a halogen atom, a hydroxy group, a cyano group, a carboxy group, an alkoxy carbonyl group, a carbamoyl group or a sulfamoyl group, and W and X each further represent a hydrogen atom.

3,960,572

PHOTOSENSITIVE COMPOSITIONS COMPRISING A POLYESTER-POLYETHER BLOCK POLYMER

Jyoji Ibata; Hidehiko Kobayashi; Kazuo Toyomoto; Kazuhiro Suzuoki; Yoshio Hayashi, and Masakazu Kurihara, all of Fuji, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 11, 1974, Ser. No. 441,547

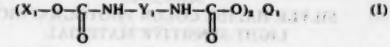
Claims priority, application Japan, Feb. 21, 1973, 48-21033; Apr. 21, 1973, 48-44646; May 21, 1973, 48-55510; Oct. 23, 1973, 48-118501

Int. Cl.² G03C *1/68, 5/00*

U.S. Cl. 96—115 P **12 Claims**

1. A photosensitive composition comprising

1. about 100 parts by weight of at least one prepolymer having a number average molecular weight of about 800 to 20,000 of the formula

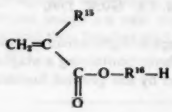


(I)

wherein

X_1 represents a residue of an alcohol having one to three ethylenically unsaturated bonds and selected from the group consisting of

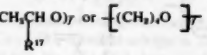
a. a compound selected from the group consisting of



wherein

R^{15} represents a hydrogen atom or methyl group,

R^{16} represents anoxyalkylene group of the formula



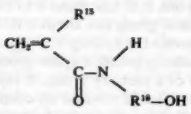
wherein

R^{17} represents a hydrogen atom, methyl, monochloromethyl or monobromomethyl group; and *f* represents an integer from 1 to 20,

b. trimethylolpropane di-acrylate or -methacrylate, glycerine di-acrylate or-methacrylate and pentaerythritol tri-acrylate or -methacrylate,

c. allyl alcohol, 2-bromoallyl alcohol 2-chloroalkyl alcohol, glycerol diallylether, trimethylolpropane diallyl ether and allyl vinyl carbinol, and

d.

(d) 

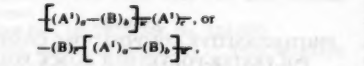
wherein

R^{15} represents a hydrogen atom or methyl group, and

R^{18} represents an alkylene having 1 to 12 carbon atoms,

Y_1 represents a residue of a diisocyanate selected from the group consisting of 2,4-tolylene diisocyanate, 2,6-tolylene diisocyanate, a mixture of 2,4-tolylene diisocyanate and 2,6-tolylene disocyanate, 4,4-diphenylmethane diisocyanate, m-xylylene diisocyanate and 1,6-hexamethylene diisocyanate.

Q_1 is a residue of a hydroxy terminated block polymer and is represented by the formula

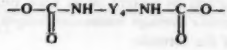


i.

A^1 represents a residue of a polyetherdiol having a number average molecular weight of about 200 to 5,000,

B. represents a residue of a saturated polyesterdiol having a number average molecular weight of about 200 to 5,000,

ii. A^1 is linked to B; A^1 is linked to A^1; and B is linked to B with a group having the formula



wherein

Y_4 represents a residue of a diisocyanate selected from the group consisting of 2,4-tolylene diisocyanate, 2,6-tolylene diisocyanate, a mixture of 2,4-tolylene diisocyanate and 2,6-tolylene diisocyanate, 4,4-diphenylmethane diisocyanate, m-xylylene diisocyanate and 1,6-hexamethylene diisocyanate,

iii. the weight ratio of the total weight of A^1 to B is in the range of from about 1:4 to 4:1,

(iv) a is an integer from 1 to 4; b is an integer from 1 to 4; *c* is an integer from 0 to 4; $2 \leqq (a+b)w + c \quad 20$,

2. 0 to about 120 parts by weight of at least one polymerizable ethylenically unsaturated monomeric compound; and

3. a photopolymerization initiator in an amont of about 0.001 to 10 eight percent of the total weight of the prepolymer (1) and the polymerizable ethylenically unsaturated monomeric compound (2).

3,960,573

NOVEL PRECIOUS METAL SENSITIZING SOLUTIONS

Rudolph J. Zeblisky, Hauppauge, N.Y., assignor to Photocircuits Division of Kollmorgan Corporation, Glen Cove, N.Y.

Continuation of Ser. No. 278,429, Aug. 7, 1972, abandoned, which is a continuation-in-part of Ser. No. 9,060, Feb. 5, 1970, abandoned, which is a continuation-in-part of Ser. No. 801,167, Feb. 20, 1969, Pat. No. 3,672,938, which is a continuation-in-part of Ser. No. 712,575, March 12, 1968, abandoned, which is a continuation of Ser. No. 551,249, May 19, 1966, abandoned, which is a continuation of Ser. No. 285,889, June 6, 1963, abandoned, which is a continuation of Ser. No. 53,352, Sept. 1, 1960, abandoned. This application Dec. 11, 1974, Ser. No. 531,724

Int. Cl.[2] C23C *3/02*

U.S. Cl. 106—1 **16 Claims**

1. An acidic aqueous solution for the sensitization of conductive and non-conductive surfaces to the reception of adherent electroless metal which comprises from about 0.01 grams to about 5.0 grams per liter of precious metal ions; an excess of a stoichiometric amount of an ion of a Group IV metal which is capable of two valence states; and a stabilizing amount, at least sufficient to prevent separation from said solution of said precious metal as a metallic film or precipitate, of a Lewis Base selected from the group consisting of hydroxylamine, ammonia and aniline.

3,960,574

DETERGENT RESISTANT AUTO POLISH

Kenneth M. Lee, Bay City, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed May 13, 1974, Ser. No. 469,255

Int. Cl.[2] C09G *1/08, 1/02*

U.S. Cl. 106—3 **12 Claims**

1. In a polish formulation containing as components thereof a wax and/or an abrasive and optionally at least one member selected from the group consisting of solvents, surfactants, thickening agents, dyes, odorants, and other ingredients normally used in making polishes, the improvement which consists of incorporating therein 1 to 10% by weight of a carboxyfunctional siloxane composed of from 0.1 to 50 mole percent of $R_aR'_bSiO_{(4-a-b/2)}$ units and from 50 to 99.9 mole percent of $R''_cSiO_{(4-c/2)}$ units wherein

R is a carboxyfunctional radical attached to the silicon atom via a silicon-to-carbon bond,

a has an average value from 1 to 3,

R′ is a hydrocarbon or halogenated hydrocarbon radical containing from 1 to 18 carbon atoms,

b has an average value from 0 to 2, the sum of $a + b$ is from 1 to 3,

R″ is a hydrocarbon or halogenated hydrocarbon radical containing from 1 to 18 carbon atoms, and

c has an average value from 0 to 3.

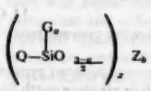
3,960,575

DETERGENT RESISTANT POLISH COMPOSITIONS

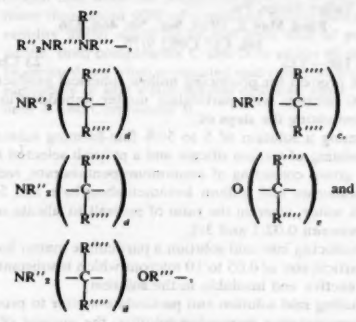
Eugene Ray Martin, Onsted, Mich., assignor to SWS Silicones Corporation, Adrian, Mich.

Filed Nov. 11, 1974, Ser. No. 522,661
Int. Cl.² C09G *1/08*
U.S. Cl. 106—10 11 Claims

1. In a polish composition comprising wax and a dispersing vehicle, the improvement which comprises incorporating therein at least 1 percent by weight of an aminofunctional silicon fluid, said aminofunctional silicon fluid is prepared by equilibrating at a temperature of from 25° C. to 200° C. a cyclic organopolysiloxane in which the organo groups are selected from the class consisting of monovalent hydrocarbon radicals and halogenated monovalent hydrocarbon radicals having up to 18 carbon atoms and an aminofunctional silicon compound represented by the formula



wherein G is selected from the group consisting of R, OR'', $OSiR_3$ and OR'''NR''_2 in which R is selected from the group consisting of movalent hydrocarbon radicals having from 1 to 18 carbon atoms and halogenated monovalent hydrocarbon radicals, R'' is selected from the group consisting of hydrogen and monovalent hydrocarbon radicals having from 1 to 18 carbon atoms, R''' is selected from the group consisting of divalent hydrocarbon radicals, divalent hydrocarbonoxy radicals in which the oxygen is in the form of an ether linkage and unsaturated divalent hydrocarbon radicals, Q is selected from the group consisting of R''_2NR'''—,



R'''' is selected from the group consisting of R and hydrogen, Z is selected from the class consisting of $R''O_{0.5}$, $R_3SiO_{0.5}$ and $R''NR'''O_{0.5}$, *a* is a number of from 0 to 2, *b* is a number of from 0 to 3, *c* is a number of from 1 to 10, *d* is a number of from 1 to 10 and *x* is a number of from 1 to 20,000 in the presence of a basic catalyst.

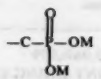
3,960,576

SILICATE-BASED CORROSION INHIBITOR

David A. Carter, Warminster, and Frederick G. Vogt, Philadelphia, both of Pa., assignors to Betz Laboratories, Inc., Trevose, Pa.

Filed June 25, 1973, Ser. No. 372,878
Int. Cl.² C09D *5/08*; C02B *5/00*; C23F *11/16*
U.S. Cl. 106—14 19 Claims

1. A composition of matter which is useful for inhibiting corrosion of the metal surfaces exposed to an aqueous system and preventing the deposition of scale thereon, consisting essentially of in parts by weight: 5 to 1,500 parts of a water-soluble alkaline oxide silicate having a ratio of SiO_2 to the alkaline oxide of from 1 to 3.5; 0.1 to 500 parts of an organic phosphonate as PO_3 wherein the organo-phosphonate has a carbon to phosphorus bond as in the formula



where M is a water soluble cation or hydrogen; and 1 to 750 parts of a carboxy methyl cellulose.

3,960,577

DENSE POLYCRYSTALLINE SILICON CARBIDE

Svante Prochazka, Ballston Lake, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jan. 8, 1974, Ser. No. 431,611
Int. Cl.² C04B *35/56*, *35/58*
U.S. Cl. 106—44 3 Claims

1. A dense hot pressed electrically conducting silicon carbide ceramic body consisting essentially of silicon carbide, a boron additive selected from the group consisting of boron and boron carbide wherein the amount of the boron additive is equivalent to 0.3–3.0% by weight of boron, and sufficient nitrogen atoms accommodated in the lattice of said silicon carbide making said body electrically conducting with a room temperature resistivity ranging up to about 50 ohm centimeters, said boron additive being in solid solution with the silicon carbide, said ceramic body consisting of a fine grained substantially uniform microstructure, being substantially pore free, and having a density of at least 98% of the theoretical density for silicon carbide.

3,960,578

ARSENIC PENTOXIDE GLASSES

Georg Krolla, Mainz-Mombach, Germany, assignor to Jenaer Glaswerk Schott & Gen., Mainz, Germany

Filed Jan. 19, 1973, Ser. No. 324,992
Claims priority, application Germany, Jan. 20, 1972, 2202652
Int. Cl.² C03C *3/12*, *3/18*, *3/30*
U.S. Cl. 106—47 Q 25 Claims

1. In an optical glass formed from a mixture of 8–60 wt. % arsenic pentoxide and correspondingly 92–40 wt. % of one or more simple or complex inorganic polyvalent metal fluorides, said mixture having a melting temperature of not more than 1,000°C., the improvement in said glass which comprises a partial exchange in said mixture of at least 0.5 wt. % of at least one member selected from the group consisting of

a. 0.5–6 wt. % of LiBr, NaBr, KBr, RbBr, CsBr and/or 1–12 wt. % of a rare earth bromide,

b. a chloride of an alkali metal, an alkaline earth metal, In, Pb, Bi, Zn, Cd, Y, a lanthanide, Nb, Ta, Zr or Th, the proportion of alkali metal chloride being up to 8 wt. %,

c. sulfate of an alkaline earth metal, alkali metal, Zn, Cd, Al, In, La, a lanthanide, Pb or Tl, and

d. an oxide of a polyvalent metal selected from the group consisting of In, Ga, B, Pb, Bi, W, Te, Tl, Cd and mixtures thereof,

provided that the metal oxide content of said glass is greater than 7.5 wt. % when the glass contains no bromide, chloride or sulfate, and the partial exchange being such that the bromide and chloride are exchanged for the polyvalent metal fluoride, the maximum amount of bromide being 12 wt. % and the maximum amount of chloride being 55 wt. %; and the sulfate and the polyvalent metal oxide are exchanged for the arsenic pentoxide, the maximum amount of sulfate being 9 wt. % and the maximum amount of polyvalent metal oxide being 25 wt. %, the sum of the arsenic pentoxide, polyvalent metal oxide, sulfate and bromide in the glass being 12–60 wt %, and that the partial

exchange is such that the maximum melting temperature of 1,000°C. is not exceeded, whereby said partial exchange results in a reduction of the devitrification tendency and in a flattening of the temperature viscosity curve of said glass.

3,960,579

TITANIUM DIOXIDE CONTAINING GLASSES HAVING A HIGH INDEX OF REFRACTION AND A HIGH DISPERSION AND PROCESS OF PRODUCING SAME

Heinz Broemer, Hermannstein; Norbert Meinert, and Johann Spincic, both of Wetzlar, all of Germany, assignors to Ernst Leitz GmbH, Optische Werke, Wetzlar, Germany

Continuation of Ser. No. 308,696, Nov. 22, 1972, abandoned. This application Apr. 9, 1975, Ser. No. 566,306

Claims priority, application Germany, Dec. 13, 1971, 2161701

Int. Cl.² C03C *3/04, 3/08, 3/10, 3/30*

U.S. Cl. 106—52 **6 Claims**

1. An optical glass having an index of refraction n_e between 1.7784 and 1.8753 and an Abbe number ν_e between 25.8 and 30.8, said glass consisting essentially of:

between about 5 and 9.9%, by weight, of silicon dioxide SiO_2;

between about 30 and 50%, by weight, of barium oxide BaO;

between about 18 and 24%, by weight, of aluminum oxide Al_2O_3; and

between about 21 and 30%, by weight, of titanium dioxide TiO_2.

3,960,580

MAGNESIUM PHOSPHATE CONCRETE COMPOSITIONS

Robert F. Stierli, Lexington; Clayton C. Tarver, Everett, both of Mass., and James M. Gaidis, Columbia, Md., assignors to W. R. Grace & Co., Cambridge, Mass.

Filed Nov. 21, 1974, Ser. No. 525,687

Int. Cl.² C04B *9/04, 35/04*

U.S. Cl. 106—58 **20 Claims**

1. A dry, quick setting cementitious composition capable of setting to a hardened mass in less than one-half hour at 70°F following the addition of water alone thereto, and containing magnesium oxide and from about 25 to about 200 weight % based on said oxide of a dry, solid monoammonium phosphate component reactive therewith as the essential binding components, and, as a retarder of the normal quick-setting time of the composition, from about 0.1 to about 20 percent by weight, based on the said binding components, of an oxyboron compound selected from the group consisting of oxyacids of boron, salts or esters thereof, or mixtures of such.

3,960,581

PROCESS FOR PRODUCING A SOLID SOLUTION OF ALUMINUM OXIDE IN SILICON NITRIDE

Ivan B. Cutler, Salt Lake City, Utah, assignor to The University of Utah, Salt Lake City, Utah

Filed Apr. 29, 1974, Ser. No. 465,222

Int. Cl.² C04D *35/58*

U.S. Cl. 106—65 **4 Claims**

1. A method of producing a refractory material consisting essentially of a solid solution of aluminum oxide in silicon nitride, the composition by weight percent being 15% to 70% aluminum oxide and 85% to 30% silicon nitride, the method comprising the steps of:

obtaining silicon dioxide and aluminum oxide reactants selected from the group consisting of:

clay having a composition by weight percent of 40% to 20% aluminum oxide and 46% to 70% silicon dioxide;

a coked mixture of rice hulls and an aluminum source, the aluminum source being selected from the group consisting of clays formed by the geologic decomposition of aluminum compounds, oxides and salts of aluminum and aluminum metal, the concentration of aluminum not exceeding 20% by weight; and

a precipitate having a composition by weight percent of 10% to 65% aluminum oxide and 35% to 90% silicon dioxide; placing the reactants in an enclosure; and

heating the reactants to a temperature within the range on the order of about 1200°C to 1600°C in the presence of carbon and nitrogen until a solid solution of aluminum oxide in silicon nitride is produced.

3,960,582

LOW POROSITY CEMENT AND PROCESS FOR PRODUCING SAME

Frank J. Ball, Charleston; David V. Braddon, Charleston Heights, and Lynden J. Stryker, Mount Pleasant, all of S.C., assignors to Westvaco Corporation, New York, N.Y.

Filed Apr. 21, 1975, Ser. No. 569,986

Int. Cl.² C04B *7/35*

U.S. Cl. 106—90 **11 Claims**

1. A method of making a free-flowing cement paste which comprises;

a. combining ground hydraulic cement without gypsum with from 0.1 to about 1.5% of alkali or alkaline earth lignosulfonate or sulfonated lignin and from 0.1 to about 2.0% of an alkali bicarbonate, and

b. mixing the combined materials from (a) with 20 to 40% of water, all percentages based on the dry weight of ground cement.

3,960,583

METHOD OF PREPARING MODIFIED HOLLOW, LARGELY SPHERICAL PARTICLES BY SPRAY DRYING

David I. Netting, Springfield, Pa., and Elliot P. Hertzenberg, Wilmington, Del., assignors to Philadelphia Quartz Company, Valley Forge, Pa.

Filed May 2, 1974, Ser. No. 466,326

Int. Cl.² C08J *9/16*

U.S. Cl. 106—122 **23 Claims**

1. The process for producing hollow spherical products of 1 to 500 microns with particulate matter imbedded in the walls, comprising the steps of;

a. forming a solution of 5 to 50% film-forming substance consisting of sodium silicate and a polysalt selected from the group consisting of ammonium pentaborate, sodium pentaborate and sodium hexametaphosphate and 50 to 95% water, wherein the ratio of polysalt to silicate solids is between 0.02:1 and 3:1;

b. introducing into said solution a particulate matter having a particle size of 0.05 to 10 microns which is substantially unreactive and insoluble in the solution;

c. agitating said solution and particulate matter to produce a homogeneous suspension-solution, the amount of said particulate solids being sufficient to provide 0.5 to 75% of the solids contained in said suspension-solution;

d. spray drying the suspension-solution at an inlet temperature of 200° to 500°C and an outlet temperature of 100° to 300°C;

e. collecting the product having a true particle density of 20 to 200 lbs/ft³.

3,960,584

WATER-DISPERSIBLE, HIGH MOLECULAR WEIGHT POLYMER COMPOSITIONS

Albert B. Savage, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Feb. 2, 1973, Ser. No. 328,952

Int. Cl.² C08L *1/26*

U.S. Cl. 106—178 **21 Claims**

1. A composition of matter comprising a finely divided, water-soluble cellulose ether, hereinafter polymeric material, of about 50,000 to about 10,000,000 average molecular weight, of a particle size predominantly larger than about 0.06

millimeter and less than about 1.7 millimeter, in intimate mixture with components A, B, C and D, the combined weight of said components being from a small effective amount to about 10% of the weight of the polymeric material, wherein:

Component A is a water-soluble polyol selected from the group consisting of lower aliphatic polyols of less than about 200 average molecular weight and lower polyalkylene glycols of from about 400 to about 9,000 average molecular weight, added in an amount of about 2% to about 8% of the weight of the polymeric material;

Component B is a surface-active agent of from about 15 to about 40 HLB, added in an amount of about 0.1% to about 2% of the weight of the polymeric material, and is selected from the group consisting of:

a. potassium and sodium salt of fatty acids,
b. potassium and sodium salts of aryl- and alkaryl-carboxylic acids,
c. potassium and sodium sulfonates of fatty acids and of fatty acid higher esters,
d. potassium and sodium salts of aryl- and alkaryl-sulfonates and -disulfonates,
e. potassium and sodium salts of higher alkanol and hydroxyalkaryl sulfates, and
f. potassium and sodium salts of carboxylic acid substituted quaternary amines;

Component C is a surface-active agent of about 15 to about 18 HLB, added in an amount of about 0.1% to about 2% of the weight of the polymeric material, and is selected from the group consisting of lower oxyalkylene ethers and polyesters of aliphatic polyols and polyol anhydrides and has an average molecular weight of about 200 to about 6,000;

Component D is a nonionic surface-active agent of less than about 10 HLB, added in an amount of about 0.1% to about 2% of the weight of the polymeric material;

provided that when the polymeric material is composed of more than about 90% of a material which hydrates with rapidity about equal to or less than that of polyacrylamide, then components C and D or either of them may be omitted and when so omitted said composition consists essentially of said water-soluble cellulose ether, Component A and Component B.

3,960,585

REDUCING H_2S-EMISSION FROM HOT CAST SULFUR-ASPHALT MIXTURES

William Gaw, Burlington, Canada, assignor to Shell Oil Company, Houston, Tex.

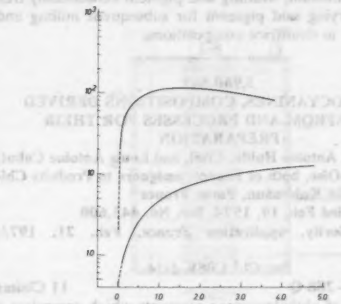
Filed Dec. 4, 1974, Ser. No. 529,429

Claims priority, application United Kingdom, Dec. 17, 1973, 58278/73

Int. Cl.² C08L 95/00; E01C 7/00

U.S. Cl. 106—274 **17 Claims**

1. In the process for casting sulfur-asphalt compositions by mixing and/or heating mixtures comprising sulfur and asphalt in a weight ratio of at least 1:1 sulfur to asphalt, said mixing and/or heating being carried out at elevated temperatures not exceeding 175°C, the improvement which comprises: carrying out the mixing and/or heating step in the presence of a hydrogen sulfide suppressant selected from the class consisting of free radical inhibitors, redox catalysts and mixtures thereof.



3,960,586

AMORPHOUS PRECIPITATED SILICEOUS PIGMENTS AND IMPROVED PROCESS FOR PRODUCING SUCH PIGMENTS

Satish K. Wason, Havre de Grace, Md., assignor to J. M. Huber Corporation, Locust, N.J.

Filed Oct. 3, 1973, Ser. No. 402,928

The portion of the term of this patent subsequent to July 8, 1992, has been disclaimed.

Int. Cl.² C09C 1/28

U.S. Cl. 106—288 B **2 Claims**

1. A method for producing amorphous, precipitated silicic acid pigments having a surface area of from 30 m^2/g to 340 m^2/g and improved chemical and physical properties including low structure, a wet cake moisture less than 75%, high abrasiveness with a valley abrasion wire loss of from 10 mg to 168 mg, high pack density in excess of 25 pounds per cubic foot, low oil absorption less than 110 cc/100 g and high cleaning action when employed in dentifrice compositions, said method comprising the steps of: providing an aqueous reaction medium containing an electrolyte comprising a salt selected from the group consisting of the sodium, potassium or lithium salts of an acid selected from the group consisting of sulfuric, nitric or hydrochloric acid, said electrolyte being present in said aqueous reaction medium in an amount in the range of from 3 to 15% by weight based on the weight of the said reaction medium; adjusting the pH of the said aqueous medium to a predetermined value in the range of from 8.0 to 10.4 and equal to that pH at which the said pigment is to be precipitated; simultaneously introducing an acidic solution and a solution of an alkali metal silicate into said aqueous reaction, said acidic solution comprising from 10 to 25% by weight based on the total weight of the said acidic solution of an acid selected from the group consisting of sulfuric acid, nitric acid and hydrochloric acid, said solution comprising a pre-polymerized alkali metal silicate having a concentration in the range of from 1.0 to 2.5 pounds per gallon of an alkali metal silicate and an SiO_2/X_2O mol ratio in the range of from about 2.0 to 3.3 wherein X is selected from the group consisting of sodium, potassium, and lithium and wherein said alkali metal silicate is selected from the group consisting of sodium silicate, potassium silicate, and lithium silicate; continuing the addition of the said acid and the said silicate to the said aqueous reaction medium in a manner such that a substantially constant pH in the range of from 8 to 10.4 is maintained and such that a substantially constant temperature in the range of from 150° to 180°F is maintained and until the precipitation of said pigment is substantially complete; adjusting the pH to provide a slurry pH of from 5.4 to 6.5; digesting the reaction

slurry at a temperature in the range of from 170° to 203°F for a period of time on the order of about 20 minutes; filtering said slurry to recover the precipitated pigment from the aqueous reaction medium, washing said pigment substantially free of salts an drying said pigment for subsequent milling and incorporation in dentifrice compositions.

3,960,587

PHTHALOCYANINES, COMPOSITIONS DERIVED THEREFROM AND PROCESSES FOR THEIR PREPARATION

Michel Ernest Antoine Huille, Creil, and Louis Antoine Cabut, Nogent-sur-Oise, both of France, assignors to Produits Chimiques Ugine Kuhlmann, Paris, France

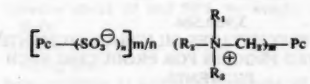
Filed Feb. 19, 1974, Ser. No. 443,600

Claims priority, application France, Feb. 21, 1973, 73.06040

Int. Cl.² C08K *5/34*

U.S. Cl. 106—288 Q **11 Claims**

1. Mixture of phthalocyanine pigments which comprises a phthalocyanine pigment unstable to flocculation or sedimentation and 1% to 20% of at least one compound of the formula:



(II)

in which Pc represents the residue of a phthalocyanine, R_1 represents an alkyl group of low molecular weight or a cycloalkyl group, R_2 represents a hydrogen atom, an alkyl group of low molecular weight or a cycloalkyl group, R_3 represents a hydrogen atom or an alkyl group of low molecular weight, R_1 and R_2 or R_1, R_2 and R_3 may also form a heterocyclic residue with the nitrogen atom and *m* and *n* each represent a whole or fractional number from 1 to 4.

3,960,588

REINFORCING PIGMENTS

Thomas D. Thompson, Flemington, and Robert W. Bradshaw, Hillsborough, both of N.J., assignors to Yara Engineering Corporation, Elizabeth, N.J.

Filed Nov. 11, 1974, Ser. No. 522,522

Int. Cl.² C08K *9/06;* **C04B** *33/13*

U.S. Cl. 106—288 Q **2 Claims**

1. A white reinforcing pigment for elastomers comprising kaolin containing an organic acid having a functional group selected from the group consisting of $-NH_2$, $-SO_3H$ and -SH.

3,960,589

STABILIZED PIGMENT AND METHOD FOR PRODUCING THE SAME

Stanley Roy Morrison, Los Altos, Calif., and Thomas Freund, Rochester, N.Y., assignors to Stanford Research Institute, Menlo Park, Calif.

Continuation-in-part of Ser. No. 323,523, Jan. 15, 1973, abandoned, which is a continuation-in-part of Ser. No. 82,539, Oct. 20, 1970, abandoned. This application May 27, 1975, Ser. No. 580,894

Claims priority, application Italy, Oct. 13, 1971, 29833/71

Int. Cl.² C09C *1/00, 1/04, 1/36*

U.S. Cl. 106—296 **8 Claims**

1. An inorganic pigment which produces electrons and holes upon exposure to ultraviolet radiation and which is coated with a chemical species in two stable oxidation states which differ from each other by one equivalent, one of said states being capable of capturing said holes and the other of said states being capable of capturing said electrons, said chemical species being present in amounts effective to stabilize the pigment against change in color or exposure to ultraviolet light.

3,960,590

MODIFIED CHROMIUM OXIDE PIGMENT

Birger Knickel, Meerbusch-Lank; Siegfried Keifer, Krefeld; Hermann Perrey, Krefeld; Hans Rudolph, Krefeld; Hans Jurgen Rosenkranz, Krefeld, and Reinhold Rudisch, Krefeld, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

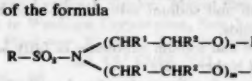
Filed Nov. 14, 1974, Ser. No. 523,879

Claims priority, application Germany, Nov. 21, 1973, 2358016

Int. Cl.² C09C *1/34*

U.S. Cl. 106—302 **5 Claims**

1. A modified chromium oxide pigment comprising chromium oxide pigment intimately admixed with 0.01 to 30% by weight, based on said pure chromium oxide pigment, of a compound of the formula



wherein R is straight or branched chain alkyl 8 to 30 carbon atoms; said alkyl substituted by fluorine, chlorine or bromine, alkaryl having up to 30 carbon atoms or phenyl; R^1 and R^2 are each, independently of the other, hydrogen, methyl, chloromethyl, ethyl or phenyl; n is a number from 1 to 100 and m is a number between 0 and 100.

3,960,591

PROCESS FOR THE PREPARATION OF PIGMENT COMPOSITIONS FOR THE DOPE DYEING OF POLYACRYLONITRILE

Reinhold Deubel, Altenhain, Taunus; Volker Hemmerling, Kelkheim, Taunus; Werner Reitz, Frankfurt am Main, and Wolfgang Teige, Kelkheim, Taunus, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Continuation of Ser. No. 292,416, Sept. 26, 1972, abandoned. This application Feb. 13, 1974, Ser. No. 441,936

Claims priority, application Germany, Sept. 28, 1971, 2148347

Int. Cl.² C09C *3/10*

U.S. Cl. 106—308 M **2 Claims**

1. A process for the preparation or formation of pigment compositions consisting of 20 to 80% of a pigment and 80 to 20% of a polyacrylonitrile polymer or copolymer wherein a suspension of solid polymer or copolymer in water is added to an aqueous mixture containing a pigment, said mixture having been formed in the process of preparing or forming said pigment, prior to any recovery of the pigment from said aqueous mixture; and thereafter the preparation or formation of the pigment is completed.

3,960,592

PHOSPHATES

James Derek Birchall, and John Edward Cassidy, both of Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 274,964, July 25, 1972, Pat. No. 3,870,737, which is a continuation of Ser. No. 42,499, June 1, 1970, abandoned. This application Oct. 21, 1974, Ser. No. 517,236

Claims priority, application United Kingdom, June 12, 1969, 29862/69

The portion of the term of this patent subsequent to Apr. 30, 1991, has been disclaimed.

Int. Cl.² C09C *3/10*

U.S. Cl. 106—308 Q **8 Claims**

1. A composition suitable for use as a coating composition comprising a halogen-containing complex phosphate of aluminium other than a phosphate ester dissolved in an organic solvent, in which the complex contains at least one chemically-bound molecule of an alcohol containing from one to 10 carbon atoms and in which the complex has been prepared by interacting an aluminium compound selected from the group

consisting essentially of aluminium halides, aluminium oxyhalides, aluminium alkoxyhalides and aluminium alkoxides with an alcohol containing one to 10 carbon atoms and with phosphoric acid, and when the aluminium compound is an alkoxide, with a halogen acid.

3,960,593

METHOD OF INCREASING THE LONG-TERM STABILITY OF A MEASURING ELEMENT OF TEXTILE TESTERS

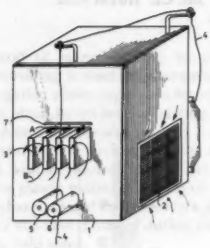
Eduard Heusser, Uster, Switzerland, assignor to Zellweger, Ltd., Switzerland

Filed Sept. 23, 1974, Ser. No. 508,624

Claims priority, application Switzerland, Sept. 26, 1973, 13805/73

Int. Cl.² B08B *5/00*

U.S. Cl. 134—37 **5 Claims**



1. A method of increasing the long-term stability of a-measuring element for a textile testing apparatus, said measuring element having a plurality of parallel plate-like components arranged outside of a housing which form at least one passage between adjacent components, which comprises forming a secondary air convection which maintains constant ambient conditions in the vicinity of the measuring element by causing an artificial airstream to sweep over the top of the measuring element, said airstream promoting said secondary air convection in the form of eddy currents within said passage.

3,960,594

PRIMARY OR SECONDARY ELECTROCHEMICAL CELL

Heinz Peter Fritz, Munich, and Jürgen Besenhard, Neusaess, both of Germany, assignors to Rheinisch-Westfalisches Elektrizitatswerk Aktiengesellschaft, Essen, Germany

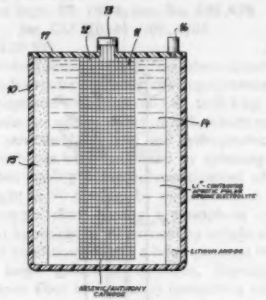
Filed Nov. 5, 1973, Ser. No. 412,678

Claims priority, application Germany, Nov. 9, 1972, 2254870

Int. Cl.² H01M *10/00*

U.S. Cl. 136—6 LN **5 Claims**

1. An electrochemical cell comprising a first electrode consisting at least in major part of lithium; a nonaqueous aprotic polar organic-solvent electrolyte containing ions of dissolved lithium in contact with said first electrode; and a solid second electrode in contact with said electrolyte and consisting at least in major part of arsenic or antimony electrochemically reacting with lithium to form a lithium-arsenic or



lithium-antimony intermetallic compound upon cathodic liberation of lithium.

3,960,595

ELECTROCHEMICAL GENERATOR

Gerard Lehmann, Liguge, and Therese Rassinoux, Neuville-de-Poitue, both of France, assignors to Saft-Societe des Accumulateurs Fixes et de Traction, Roumainville, France

Continuation of Ser. No. 328,029, Jan. 30, 1973, abandoned. This application Sept. 19, 1974, Ser. No. 507,573

Claims priority, application France, Jan. 31, 1972, 72.03141; Mar. 23, 1972, 72.10278; Oct. 30, 1972, 72.38413

Int. Cl.² H01M *43/06*

U.S. Cl. 136—6 LN **18 Claims**

1. Electrochemical cell with a negative electrode, the active material of which is lithium, with a positive electrode, the active material of which is selected from the group consisting of copper oxide and monovalent silver chromate and with an electrolyte in said cell comprising a solute and at least one solvent consisting of an ether selected from the group consisting of 1-3 dioxane, dioxolane and propylene oxide.

3,960,596

BATTERY CASING AND HERMETICALLY SEALED SODIUM-SULFUR BATTERY

Stephan P. Mitoff, Elnora; Robert W. Powers, and Manfred W. Breiter, both of Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

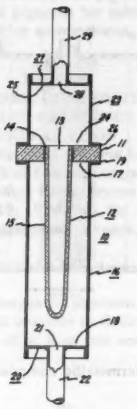
Filed Mar. 4, 1974, Ser. No. 447,850

Int. Cl.² H01M *1/02*

U.S. Cl. 136—6 FS **5 Claims**

1. A battery casing comprising a ceramic ring, an inner casing of a solid sodium ion-conductive material with one open end, a glass seal sealing a portion of the outer wall of the inner casing adjacent its open end within and to the ceramic ring, a first outer metallic casing with opposite open ends and a flange at one open end, the first outer metallic casing surrounding the inner casing and spaced therefrom, the flange of the first outer metallic casing adjacent the ceramic ring, a glass seal sealing the flange of the first outer metallic casing to one surface of the ceramic ring, the first outer metallic casing and the inner casing defining a completely open chamber between the exterior surface of the inner casing and the interior surface of the outer casing, a removable metallic closed end for the opposite open end of the first outer casing, a second outer metallic casing with opposite open ends and a flange at one open end positioned with the flange adjacent the ceramic ring whereby the second outer metallic casing is spaced from and extends in an opposite direction to the first

outer metallic casing portion, a glass seal sealing the flange of the second outer metallic casing to the opposite surface of the



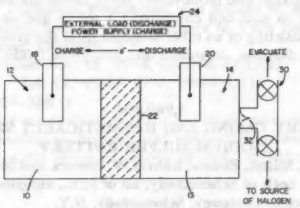
ceramic ring, and a second removable metallic closed end for the opposite open end of the second outer metallic casing.

3,960,597

METHOD FOR FABRICATING ELECTROCHEMICAL CELLS

John Werth, Princeton, N.J.; Dell A. Crouch, Langhorne, Pa., and Jack C. Sklarchuk, Trenton, N.J., assignors to ESB Incorporated, Philadelphia, Pa.

Filed June 9, 1975, Ser. No. 585,022
Int. Cl.[2] H01M *10/00*
U.S. Cl. 136—6 FS 11 Claims



1. A method for fabricating a high-temperature secondary cell in which the electrolyte, the positive reactant or the negative reactant thereof is capable of reacting with moisture or oxygen contained in the atmosphere comprising the steps of:

A. preparing a first mixture comprising carbon, aluminum metal powder and an alkali metal halide;

B. reacting a halogen with the mixture of step (A) while simultaneously heating the mixture of step (A) to cause an aluminum halide to be formed which will in turn react with the alkali metal halide in the first mixture of step (A) to form an alkali metal haloaluminate;

C. adding aluminum metal powder and one or more materials which will form the positive reactant of the cell to the resulting product of step (B) to form a second mixture, said one or more materials consisting essentially of a material selected from the group consisting of metals at least as noble as aluminum, metal-like elements, sulfur and mixtures thereof;

D. providing a cell container having positive and negative reactant compartments, a solid member separating the cell compartments which is selectively-ionically conductive with respect to cations of the negative reactant material of the cell, and current collectors for each cell compartment;

E. providing an electrical contact between the solid member and the current collector in the negative reactant compartment;

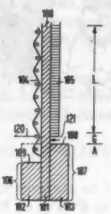
F. while maintaining the cell at its operating temperture, electrically charging the second mixture of step (C) in the positive reactant compartment of the cell container whereby the negative reactant of the cell comprising a molten alkali metal is provided in the negative reactant compartment of the cell container and a positive reactant-electrolyte melt is provided in the positive reactant compartment of the cell container.

3,960,598

FILTER PRESS-TYPE FUEL CELL BATTERY

Hans Kohlmüller, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Mar. 21, 1974, Ser. No. 453,396
Claims priority, application Germany, Mar. 30, 1973, 2316067
Int. Cl.[2] H01M *8/02*
U.S. Cl. 136—86 R 7 Claims



1. In a fuel cell battery of the filter press type which uses a liquid electrolyte and at least one gaseous reactant comprising:

a. a plurality of individual fuel cells each having:

1. a gas chamber containing an electrode;
2. an electrolyte chamber containing at least one of a support frame and a support frame and an electrode;
3. an asbestos diaphragm separating said gas chamber and electrolyte chamber;
4. separator sheets separating individual fuel cells from each other;
5. each asbestos diaphragm having electrolyte impermeable gas-tight outer zones of increased thickness, which outer zones are compressed and contain supply ducts therein for supplying materials to the gas and electrolyte chambers, both said electrodes and support frames extending in all directions substantially to meet said impermeable gas-tight outer zones of increased thickness, the improvement comprising:

b. the part of the outer zone of increased thickness on the electrolyte side of the asbestos diaphragm having a width smaller than the part of the outer zone of increased thickness on the gas side and at least one of a support frame and an electrode in the electrolyte chamber extending beyond the inner edge of the part of the outer zone of increased thickness of the gas side.

3,960,599

BUTTON TYPE CELL AND BATTERY

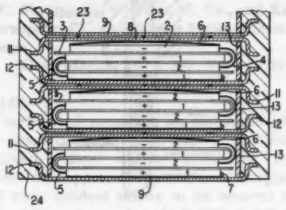
Jacques Reynier, Eymet, and Michel Guglier, Bassens, both of France, assignors to SAFT-Societe des Accumulateurs Fixes et de Traction, Romainville, France

Continuation of Ser. No. 386,438, Aug. 7, 1973, abandoned. This application Feb. 6, 1975, Ser. No. 547,443

Claims priority, application France, Aug. 10, 1972, 72.28941

Int. Cl.² H01M 31/00

U.S. Cl. 136—111 6 Claims



1. A method of manufacturing an electrochemical cell comprising providing a stack of alternately disposed positive plates and negative plates separated by separator sheets, surrounding said stack by an insulative ring, electrically linking the endmost plates of opposite polarity to a pair of collectors disposed respectively at each end of the stack, impregnating the said stack with an electrolyte and then molding an electrically insulative plastic material in form of a frame around and over the peripheral rims of the collectors, said ring limiting the penetration of the said material during molding to prevent it from reaching said stack.

3,960,600

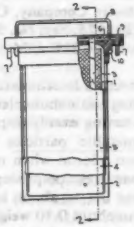
ANODE CONSTRUCTION

Stewart M. Chodosh, Lake Success, N.Y., assignor to Leesona Corporation, Warwick, R.I.

Continuation-in-part of Ser. No. 627,194, March 30, 1967, abandoned. This application Mar. 9, 1971, Ser. No. 122,489

Int. Cl.² H01M 3/00

U.S. Cl. 136—120 R 10 Claims



1. An anode for an electrochemical cell comprising a porous anodic metal body wrapped in first and second layers of different and distinct materials, said first layer being gas-impermeable when in contact with an aqueous electrolyte, hydrophilic, and ion-permeable; and said second layer being gas-permeable when in contact with an aqueous electrolyte, hydrophilic, dimensionally stable, and heat sealable.

3,960,601

FUEL CELL ELECTRODE

David Arthur Schulz, Fairview Park, Ohio, assignor to Union Carbide Corporation, New York, N.Y.

Filed Sept. 27, 1974, Ser. No. 509,970

Int. Cl.² H01M 4/06, 4/08

U.S. Cl. 136—120 FC 28 Claims

1. In a thin web of non-woven carbon fibers suitable for use as a substrate in fuel cell electrodes, the improvement wherein the web is impregnated with from 0.05 kg. to 0.5 kg. of a fused hydrophobic resin per square meter of web, which resin serves to increase the structural integrity and hydrophobicity of the web, and the web has been produced by spinning carbonaceous pitch fiber having a mesophase content of from 40 percent by weight to 90 percent by weight from a nonthixotropic carbonaceous pitch having a mesophase content of from 40 percent by weight to 90 percent by weight and which, under quiescent conditions, forms a homogeneous bulk mesophase having large coalesced domains, disposing staple lengths of the spun fiber in intimately contacting relationship with each other in a non-woven fibrous web, heating the web produced in this manner in an oxidizing atmosphere to thermoset the fibers to an extent which will allow the fibers to maintain their shape upon heating to more elevated tepmperatures, and further heating the web containing the thermoset fibers to a carbonizing temperature in an oxygen-free atmosphere so as to expel hydrogen and other volatiles.

3,960,602

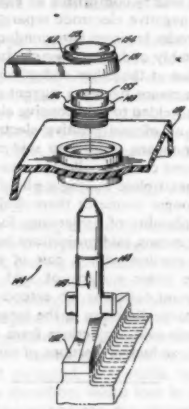
INTERCELL CONNECTOR ASSEMBLY FOR POSITIVE DISPLACEMENT CASTING SYSTEM

Raymond L. Schenk, Jr., Doylestown, Pa.; John A. Bruzas, Trenton, N.J., and William E. Coville, Morrisville, Pa., assignors to Gould Inc., Rolling Meadows, Ill.

Filed Jan. 21, 1974, Ser. No. 435,182

Int. Cl.² H01M 2/26

U.S. Cl. 136—134 R 1 Claim



1. An improved intercell connector assembly comprising, in combination, an intercell connector having a vertically disposed opening formed in each end thereof and an upstanding annular collar formed on each end of said connector in coaxial surrounding relation to each of said openings, an annular cover bushing having an outwardly projecting radial flange and an upwardly extending cylindrical flange, and upstanding battery post passing coaxially through said bushing and projecting vertically above the upper end of said cylindrical flange, said intercell connector being seated on said radial flange with one of the openings formed therein being coaxial with said upwardly extending cylindrical flange and said post and defining an annular cavity between said post and said

coaxial annular collar, said annular collar projecting upwardly above the level of said cylindrical flange and terminating below the upper end of said post for forming a dam to initially confine the molten lead upon melting of the upper end of said post, the inner peripheral surface of said annular collar and upper end of said cylindrical flange whereby the molten material formed will completely fill said annular cavity between said post and said connector at the upper end of said cylindrical flange to a level substantially equal to the upper surface of said annular collar.

3,960,603

ALKALINE BATTERY

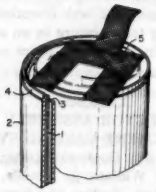
Yuji Morioka, and Shigeo Dejima, both of Sumoto, Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Dec. 13, 1974, Ser. No. 532,397

Claims priority, application Japan, Apr. 15, 1974, 49-42507; Nov. 29, 1974, 49-38592

Int. Cl.² H01M *2/30*

U.S. Cl. 136—135 R **5 Claims**



1. An alkaline battery comprising an electrode assembly of a positive and a negative electrode separated by a separator, one of said electrodes having a bare conductive portion at one end of said assembly and the other electrode having a bare conductive portion at the other end of said assembly, a first current collector means having a current collector tab and a current collector welded to said positive electrode and covering substantially all of said positive electrode and a second current collector means welded to said negative electrode, said first and second current collector means each comprising a thin flexible metal plate having a plurality of non-circular holes with the longer diameter thereof aligned in the same direction and a plurality of projections formed on each said current collector means, said projections being welded to each said conductive portion with a pair of spot welding poles disposed on the outer surface of said current collector, wherein said current collector tab extends from said current collector in the same direction as the longer diameter of said holes, and wherein said projections form welded conductive points with said conductive portions of said assembly.

3,960,604

DEVICE FOR TEMPERATURE MEASUREMENTS

Friedrich Heitzinger, and Wilhelm Lechleitner, both of Reutte, Austria, assignors to Schwarzkopf Development Corporation, New York, N.Y.

Filed Apr. 15, 1974, Ser. No. 461,211

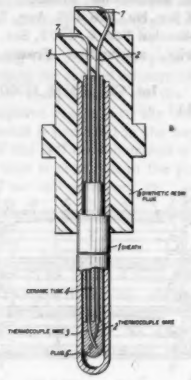
Claims priority, application Austria, Apr. 20, 1973, 3588/73; Jan. 18, 1974, 433/74

Int. Cl.² H01L *35/10*

U.S. Cl. 136—233 **23 Claims**

1. In a thermocouple measuring device for the measurement of temperature, an improved thermocouple sensor comprising a pair of thermocouple wires formed from tungsten-rhenium or molybdenum-rhenium alloys and terminating in ends adapted for thermocouple application,

and a metal mass of tungsten or molybdenum intimately contacting said terminal wire ends so as to form an electrical connection therebetween at the measuring end of the device.



3,960,605

METHOD OF IMPLANTATION OF BORON IONS UTILIZING A BORON OXIDE ION SOURCE

Siegfried Beck; Karl Brack, and Peter Gansauge, all of Boeblingen, Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 23, 1975, Ser. No. 543,214

Int. Cl.² H01L *21/265*

U.S. Cl. 148—1.5 **12 Claims**

1. In an ion implantation process comprising

vaporizing a material comprising boron oxide,

introducing the resulting vapor into a gas discharge ion generation source,

extracting and separating boron ions generated by said source, and

injecting said boron ions into a semiconductor substrate.

3,960,606

ALUMINUM SILICON ALLOY AND METHOD OF PREPARATION THEREOF

E. Henry Chia, and Kenneth E. Chadwick, both of Carrollton, Ga., assignors to Southwire Company, Carrollton, Ga.

Filed Mar. 12, 1975, Ser. No. 557,847

Int. Cl.² C22F *1/04*

U.S. Cl. 148—2 **8 Claims**

1. A method of preparing a heat resistant aluminum alloy electrical conductor having a minimum electrical conductivity of 61percent IACS and having evenly dispersed therein iron-aluminum-silicon intermetallic particles having a particle diameter of less than one micron when measured along the transverse axis of said particles comprising the steps of:

a. Alloying from about 0.4 to about 1.00 weight percent silicon, no more than about 0.30 **weight percent iron and the balance of aluminum containing trace elements selected from the group consisting of copper, manganese, magnesium, titanium, vanadium and zinc wherein the individual concentrations of said trace elements do not exceed** 0.05 weight percent and the total concentration of said trace elements does not exceed 0.15 weight percent;

b. Casting the alloy in a moving mold formed between a groove in the periphery of a rotating casting wheel and a metal belt adjacent to said groove for a portion of its length to form a continuous bar; and

c. Hot-rolling the continuous bar substantially immediately after casting while the continuous bar is in substantially that condition as cast to form a continuous rod.

2. The method of claim 1 further including the steps of drawing said continuous rod through a series of wire-drawing dies without intermediate anneals to form a wire; and annealing or partially annealing said wire.

3,960,607
NOVEL ALUMINUM ALLOY, CONTINUOUSLY CAST ALUMINUM ALLOY SHAPES, METHOD OF PREPARING SEMIRIGID CONTAINER STOCK THEREFROM, AND CONTAINER STOCK THUS PREPARED

Carmen C. Manzonelli, Weirton, W. Va., and Robert G. Blossey, Coraopolis, Pa., assignors to National Steel Corporation, Pittsburgh, Pa.

Filed Mar. 8, 1974, Ser. No. 449,392
Int. Cl.² C22F *1/04*
U.S. Cl. 148—2 **34 Claims**

17. A method of preparing an aluminum alloy semirigid container stock comprising the steps of continuously casting an aluminum alloy casting consisting essentially of 0.30–0.50% of copper, 0.35–0.60% of magnesium, up to 0.50% of zinc, residual silicon in an amount up to 0.40%, residual iron in an amount up to 0.70%, residual manganese in an amount up to 0.10%, residual chromium in an amount up to 0.10%, residual sodium in an amount up to 0.0006%, other residual elements in a total amount up to 0.15% and in an amount up to 0.05% for each of said other residual elements and the remainder aluminum, cold rolling the said continuously cast aluminum alloy casting in strip form having a thickness not greater than about one inch in a plurality of cold rolling passes including first and last cold rolling passes and in the absence of a homogenizing thermal treatment to a final thickness of about 0.001–0.01 inch, and annealing the said strip at least once intermediate the said first and last cold rolling passes at an annealing temperature of 600°–800°F. for a period of 1–6 hours.

3,960,608
MEMBERS HAVING A CUTTING EDGE

William L. Cole, Camberley, England, assignor to Wilkinson Sword Limited, England

Filed Aug. 2, 1973, Ser. No. 384,943
Claims priority, application United Kingdom, Aug. 5, 1972, 36646/72
Int. Cl.² C23C *13/00*; B26B *21/54*
U.S. Cl. 30—346.54 **13 Claims**

1. A ferrous member having a cutting edge with a distinct boron coating thereon, the coating being from 50 to 600 Angstroms thick.

4. A razor blade having a cutting edge, said cutting edge having a distinct boron coating thereon, the coating being from 50 to 600 Angstroms thick.

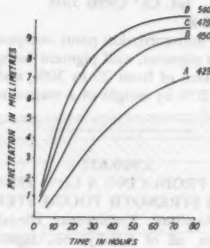
12. A method of manufacturing a ferrous member having a cutting edge which includes the step of coating the cutting edge with boron to a thickness of from 50 to 600 Angstroms.

3,960,609
PROCESS FOR HYDRIDING MAGNESIUM BASED ALLOYS

William Unsworth, Swinton, Manchester, and Gordon Arthur Fowler, Whitefield, Manchester, both of England, assignors to Magnesium Elektron Limited, Manchester, England

Filed Sept. 13, 1974, Ser. No. 505,539
Claims priority, application United Kingdom, Sept. 13, 1973, 43032/73
Int. Cl.² C23C *11/00*
U.S. Cl. 148—6.3 **10 Claims**

1. A process for hydriding magnesium alloys containing at least 80% by weight of magnesium, in two stages, comprising exposing the alloy at a temperature from 400°C to the solidus temperature of th alloy to a wet atmosphere of hydrogen having a dew point of at least −20°C for a period at least sufficient to effect activation of the alloy surface not exceeding 6 hours and



then exposing the so treated alloy at a temperature from 400°C to the solidus temperature of the alloy to a wet atmosphere of hydrogen having a dew point not exceeding −40°C for a period sufficient to achieve the desired degree of hydriding.

3,960,610
PROCESS FOR COATING METALS

Lester Steinbrecher, Southampton, and Wilbur S. Hall, Plymouth Meeting, both of Pa., assignors to Amchem Products, Inc., Ambler, Pa.

Continuation-in-part of Ser. No. 113,685, Feb. 8, 1971, abandoned, which is a division of Ser. No. 791,801, Jan. 16, 1969, Pat. No. 3,585,084, which is a continuation-in-part of Ser. No. 554,336, June 1, 1966, abandoned, which is a continuation-in-part of Ser. No. 152,992, June 14, 1971, Pat. No. 3,776,848, which is a continuation-in-part of Ser. No. 791,801, Jan. 16, 1969. This application June 14, 1972, Ser. No. 262,833
Int. Cl.² B05D *1/18*; B32B *15/08*
U.S. Cl. 148—6.14 R **12 Claims**

1. A method for coating a metallic surface comprising applying to said surface an organic-inorganic coating by immersing said surface in a coating composition comprising an acidic aqueous solution of an oxidizing agent and solid particles of a preformed organic coating-forming polymeric resinous material dispersed throughout the composition wherein the ingredients of said composition are present in amounts such that said composition will chemically attack, in the absence of an external electrical potential, a metallic surface immersed therein to dissolve therefrom metal ions in an amount sufficient to cause said resinous material to deposit on said surface a resinous coating which increases in thickness or weight during at least a portion of the time said surface is immersed in said composition and to form on said surface an inorganic coating sandwiched between said surface and said resinous coating, thereby forming an organic-inorganic coating on said surface as set forth, withdrawing the coated surface from said composition, and thereafter applying to said coated metallic surface a coating-forming material which forms an overlying coating having functional or decorative properties, and wherein said inorganic coating is an inorganic metal oxide coating which is an oxide of the metal of the metallic surface being coated and wherein said composition is free of ingredients which form on said surface an inorganic coating other than said metal oxide coating.

3,960,611

COATING COMPOSITIONS WITH MAGNESIUM PHOSPHATE PIGMENT

Ralph Lawrence Walker, Blyth, and John Richard Stockdale, Birmingham, both of England, assignors to Albright & Wilson Limited, Oldbury, England

Filed Dec. 9, 1974, Ser. No. 531,201

Claims priority, application United Kingdom, Dec. 13, 1973, 57871/73; Sept. 24, 1974, 41484/74

Int. Cl.² C09D 5/08

U.S. Cl. 148—6.15 R 13 Claims

1. A non-liquid anti-corrosion paint composition comprising a binder and a pigment, said pigment being in a pigment volume concentration of from 20 to 30%, and said pigment containing at last 20% by weight of a magnesium phosphate.

3,960,612

METHOD FOR PRODUCING A LOW TEMPERATURE HIGH STRENGTH TOUGH STEEL

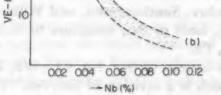
Katsuo Kaku; Hirofumi Yoshimura; Hiroshi Yada, and Naoomi Yamada, all of Kitakyushu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Aug. 7, 1974, Ser. No. 495,332

Claims priority, application Japan, Aug. 15, 1973, 48-90871

Int. Cl.² C21D 7/14

U.S. Cl. 148—12 F 6 Claims



1. A method for producing a low temperature high strength tough steel which comprises steps of; providing a steel material as hot-rolled which comprises in addition to iron and unavoidable impurities, the following essential ingredients 0.03 – 0.15% C 0.05 – 0.04% Si, 0.2 – 2.0% Mn, 1.0 – 4.5% Ni, 0.1 – 0.5% Mo, 0.005 – 0.050% Nb, up to and including 0.02% N, and 0.005 – 0.070% Al; quenching said steel material after heating at a temperature between 660°C and 750°C; and then tempering the same after heating at a temperature of 650°C or less.

3,960,613

WAX-FLUX COMPOSITION CONTAINING AMINE SALTS OF CARBOXYLIC ACIDS FOR SOLDERING

Robert A. Stayner, Lafayette, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Jan. 31, 1975, Ser. No. 545,870

Int. Cl.² B23K 35/34

U.S. Cl. 148—23 20 Claims

1. A wax-flux composition for use in a low-temperature soldering process, comprising:

A. a major amount of a wax having an AMP of between 40°C and 100°C, and

B. an amount effective to cause fluxing, at or below the soldering temperature of the piece to be soldered in said process of an amine salt of an alpha-bromo aliphatic carboxylic acid.

3,960,614

WAX-FLUX COMPOSITION CONTAINING A DIESTER OF SULFOMALEIC ACID FOR SOLDERING

Robert A. Stayner, Lafayette, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Jan. 31, 1975, Ser. No. 545,943

Int. Cl.² B23K 35/34

U.S. Cl. 148—23 12 Claims

1. A wax-flux composition for use in a low-temperature soldering process, comprising:

A. a major amount of a wax having an average melting point between 40°C and 100°C, and

B. an amount effective to cause fluxing, at or below the soldering temperature, of the piece to be soldered in said process of a wax-soluble dialkyl ester of sulfomaleic acid.

3,960,615

WELDABLE BAR, ESPECIALLY FOR USE IN REINFORCING CONCRETE

Theo Breedijk, Heemskerk, Netherlands, assignor to Hoogovens Ijmuiden, B.V., Ijmuiden, Netherlands

Filed Apr. 11, 1974, Ser. No. 459,933

Claims priority, application Netherlands, Apr. 16, 1973, 7305262

Int. Cl.² C22C 39/26, 39/54

U.S. Cl. 148—36 5 Claims

1. A hot rolled air cooled weldable bar, consisting of a Si-semi-killed BOF-steel containing not less than 0.18% and not more than 0.29% C, not less than 1.20% and not more than 1.50% Mn, less than 0.1% Si, less than 0.01% Al, less than 0.005% N, less than 0.05% P, less than 0.05% S, in total less than 0.15% Cr, Ni, Mo, Cu and Sn, and at least some but less than 0.04% Nb.

3,960,616

RARE EARTH METAL TREATED COLD ROLLED, NON-ORIENTED SILICON STEEL AND METHOD OF MAKING IT

James D. Evans, Middletown, Ohio, and William R. Long, Jr., Renfrew, Pa., assignors to Armco Steel Corporation, Cincinnati, Ohio

Filed June 19, 1975, Ser. No. 588,295

Int. Cl.² H01F 1/04

U.S. Cl. 148—111 15 Claims

1. A refined melt composition for a cold rolled, non-oriented silicon steel comprising in per cent by weight from about 0.5 to about 4% silicon, up to about 0.8% aluminum, from about 0.05 to about 0.5% manganese, about 0.012% maximum sulfur, up to about 0.1% maximum carbon and a positive amount of up to about 400 ppm. cerium, the balance being iron.

3,960,617

METHOD OF PRODUCING METAL PARTS HAVING MAGNETIC AND NON-MAGNETIC PORTIONS

Felix Lvovich Levin, Nova-Khoroshevskoe shosse, 26, korpus 3, kv. 29; Sergei Alexandrovich Golovanenko, 9 Parkovaya ulitsa, 57, korpus 3-a, kv. 12; Mikhail Vasilievich Pridantsev, ulitsa Krasnokazarmennaya, 3, kv. 299, and Vladimir Alexandrovich Dmitriev, Lesnaya ulitsa 1/2, kv. 26, all of Moscow, U.S.S.R.

Continuation of Ser. No. 346,884, April 2, 1973, abandoned. This application Dec. 11, 1974, Ser. No. 531,778

Int. Cl.² H01F 1/00

U.S. Cl. 148—121 19 Claims

1. A method of producing an integral metal part having both magnetic and non-magnetic portions comprising the steps of: selecting a metal part made of an alloy comprising, by weight, not more than 1% carbon, at least one element selected from the group consisting of nickel in an amount of from 0.5–25% and cobalt in an amount of from 20–60%, 9–30% of at least one element selected from the group consisting of chromium

and vanadium, and the balance being iron; heating portions of the part intended to form a magnetic structure to a temperature of from 450°–980°C; soaking the portions at the temperature until the magnetic structure is formed; and cooling the portions having the magnetic structure; heating portions of the part intended to form a non-magnetic structure to a temperature of from 1000°C to the melting point of the alloy until the non-magnetic structure is formed; and cooling the portions having the non-magnetic structure in water to prevent the formation of the magnetic structure.

3,960,618
EPITAXIAL GROWTH PROCESS FOR COMPOUND SEMICONDUCTOR CRYSTALS IN LIQUID PHASE

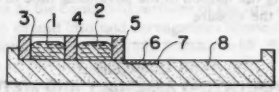
Masao Kawamura, Fuchu; Kazuhiro Ito, Tokyo; Makoto Morioka, Tokyo; Yuichi Ono, Tokyo; Sachio Ishioka, Tokyo, and Kazuhiro Kurata, Hachioji, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Mar. 25, 1975, Ser. No. 561,795

Claims priority, application Japan, Mar. 27, 1974, 49-33547

Int. Cl.² H01L *7/38*

U.S. Cl. 148—171 **5 Claims**



1. An epitaxial growth process for compound semiconductor crystals of III–V and II–VI compounds in liquid phase comprising:
   - preparing a substrate crystal of a compound semiconductor,
   - preparing an etching solution containing the constituent elements of said compound semiconductor, which is unsaturated with respect to the solute at a temperature at the beginning of crystal growth,
   - preparing a solution for crystal growth containing a III–V or II–VI compound to be grown,
   - heating said substrate crystal, said etching solution and said solution for crystal growth to the temperature at the beginning of crystal growth,
   - bringing said substrate in contact with said etching solution,
   - bringing said substrate in contact with said solution for crystal growth just after having removed said substrate crystal from said etching solution, and
   - growing epitaxially a crystal of said compound semiconductor on said substrate crystal.

3,960,619
PROCESS FOR PREPARING LAYERS OF SILICON CARBIDE ON A SILICON SUBSTRATE

Hartmut Seiter, Munich, Germany, assignor to Consortium fur Elecktrochemische Industrie GmbH, Munich, Germany

Filed Nov. 29, 1974, Ser. No. 528,050

Claims priority, application Germany, Dec. 28, 1973, 2364989

Int. Cl.² H01L *21/205;* **C01B** *31/36*

U.S. Cl. 148—175 **5 Claims**

1. In a process for producing an epitaxial layer of hexagonal silicon carbide on a silicon monocrystal substrate by simultaneous reduction or thermal decomposition of a gas mixture containing silicon halides and organosilanes, mixtures of the two, hydrocarbons, and hydrogen on said substrate, the improvement, which consists of having water present in said gas mixture.

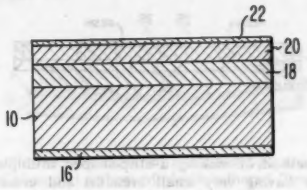
3,960,620
METHOD OF MAKING A TRANSMISSION MODE SEMICONDUCTOR PHOTOCATHODE

Michael Ettenberg, Freehold, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 21, 1975, Ser. No. 569,850

Int. Cl.² H01L *21/20, 21/31, 31/00*

U.S. Cl. 148—175 **6 Claims**



1. A method of making a transmission semiconductor photocathode comprising the steps of
   - a. coating a surface of a flat body of a single crystalline semiconductor compound which is capable of becoming disassociated when subjected to a specific temperature with a layer of an optically transparent material at a temperature below said specific temperature, said optically transparent material being capable of preventing disassociation of the material of the body when the body is heated to the specific temperature, then
   - b. epitaxially depositing at least one layer of a single crystalline semiconductor material on another surface of said body, and
   - c. coating said semiconductor material layer with a layer of a work-function-reducing material.

3,960,621
PROPELLENTS

Edward Whitworth, West Kilbride, Scotland; Stuart Gordon, Kidderminster, England, and Stephen Harry Hayes, West Kilbride, Scotland, assignors to Imperial Chemical Industries Limited, London, England

Continuation-in-part of Ser. No. 645,642, March 12, 1957, abandoned. This application June 12, 1959, Ser. No. 820,058

Claims priority, application United Kingdom, Nov. 5, 1958, 35605/58

Int. Cl.² C06B *31/26, 29/20, 29/08, 25/34*

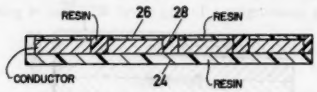
U.S. Cl. 149—65 **5 Claims**

1. A process for the production of a cast propellent which consists in blending a colloided nitrocellulose smokeless powder composition containing a platonisation agent selected from the group consisting of lead stearate, lead citrate, lead salicylate, lead 2:4 dihydroxybenzoate, lead sulphite, lead oxide, copper oxalate, copper salicylate, copper 2:4 dihydroxy-benzoate and cupric oxide, with a colloided nitrocellulose smokeless powder composition containing a secondary flash suppressing potassium salt in the proportion by weight of at least three parts of the first mentioned nitrocellulose composition to each one part of the second mentioned nitrocellulose composition, adding to the blended nitrocellulose compositions a casting liquid consisting essentially of nitroglycerine in an amount sufficient to fill the interstices in the blended nitrocellulose compositions, and heating the resulting mixture.

3,960,622
METHOD OF MAKING STRIP-SHAPED MULTIPLE CONDUCTOR

Erich Höfling, and Hanspeter Breu, both of Kreuzlingen, Switzerland, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Filed June 14, 1973, Ser. No. 369,797
Claims priority, application Switzerland, June 16, 1972, 9105/72
Int. Cl.² C23F 1/02
U.S. Cl. 156—3 **8 Claims**

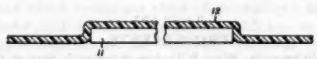


1. A method of making a strip-shaped multiple electric conductor having very small breadths and cross-sections, comprising the steps of, providing a strip of electrically conducting material, applying a first layer of a first insulating material to one wide side of the strip and a second layer of a second insulating material to the other wide side of the strip, mechanically removing the first insulating material of the first layer above the strip to define at least one groove penetrating so far as to expose the conducting material, removing the exposed conducting material throughout its thickness to the top of the second layer, so as to form at least one longitudinal cavity in the strip, and filling the cavity and the groove with a third insulating material.

3,960,623
MEMBRANE MASK FOR SELECTIVE SEMICONDUCTOR ETCHING

Francis C. Gantley, Fulton, N.Y., assignor to General Electric Company, Syracuse, N.Y.

Filed Mar. 14, 1974, Ser. No. 451,222
Int. Cl.² H01L 7/50
U.S. Cl. 156—16 **9 Claims**

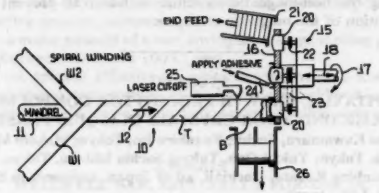


1. Method of selectively etching wafers of semiconductor material, said method comprising the steps of:
- supplying a wafer of semiconductor material, wherein one side of said wafer is not to be etched;
- covering said side and at least a part of the peripheral edge therearound with a sheet of pliable plastic membrane such that said membrane conforms to the shape of said side and part of said edge and forms a seal therewith and said membrane does not contact the side of said wafer opposite said one side, said step of covering comprising the substeps of:
- placing said membrane on said one side;
- heating said membrane to enhance conformity and drawing a vacuum between said membrane and said wafer;
- applying mechanical pressure to said membrane to further promote uniformity; and
- cooling said membrane; and
- exposing the combination of said wafer and said membrane to an etchant so that said wafer, where exposed, is etched and said side of said wafer is not etched, and wherein said membrane and said etchant are selected so that said membrane is nonreactive with said etchant.

3,960,624
METHOD OF FABRICATING TUBULAR BODIES

Paul M. Erlandson, Palos Park, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

Filed Nov. 13, 1974, Ser. No. 523,480
Int. Cl.² B29C 27/14
U.S. Cl. 156—69 **18 Claims**

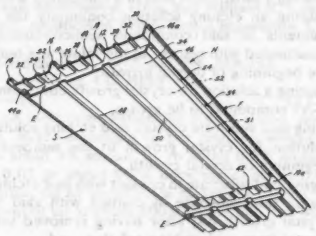


1. A method of fabricating tubular bodies having at least one closed end comprising the steps of advancing material along a predetermined path of travel in a predetermined direction, forming the material into a tube during its advancement, disposing a closure in-line with the advancement of the tube, and utilizing the motion of the advancing tube to assemble the latter with the closure.

3,960,625
HEAT INSULATING ASSEMBLY AND METHOD FOR MAKING SAME

Robert Scott Simpson, Houston, Tex., assignor to Reichhold Chemicals, Inc.

Filed Dec. 23, 1974, Ser. No. 535,997
Int. Cl.² B29D 9/00
U.S. Cl. 156—79 **1 Claim**



1. A method of forming heat insulating skylight assemblies using a first panel of fiberglass reinforced polyester having a plurality of corrugations and a second panel of fiberglass reinforced polyester having a plurality of corrugations, comprising the steps of:
- forming the second panel by initially forming a continuous strip of the fiberglass reinforced polyester corrugated panel material including the basic stages of paying off a bottom sheet of cellophane or other film;
- pumping a layer of polyester resin blended with various monomers, pigments, promoters, catalysts and other additives onto the moving sheet of film with the thickness and uniformity of the resin layer being controlled by a doctor blade;
- feeding glass fiber roving into rotary choppers and depositing the chopped strands by gravity on the resin layer;
- forcing the glass into the resin with chain saturators;
- placing a top sheet of cellophane or other film on top of the moving laminate in such a way as to prevent entrapment of air;

heating and passing the moving laminate through forms or dies to give it the desired cross-sectional shape;
further heating to cause gelling of the resin;
moving the laminate through temperature controlled ovens where the resin cures;
trimming the edges of the moving sheet with saws; and
stripping away the film and cutting the material panels with a moving end-cut saw to proper desired length to provide a panel of uniform cross-section throughout its length;
disposing the second panel having a base, upstanding longitudinal sides, and open ends, with its corrugations spaced from the corrugations of a first panel with its longitudinal side edges on a surface of the first panel;
securing the longitudinal side edges of the second panel to the first panel with mechanical fasteners with sealing of the longitudinal edges between the second panel with the first panel to prevent fluid migration therebetween with double coated foam tape to provide a continuous open gap between the second panel and the first panel at each open end thereof;
closing the continuous open gap adjacent each of the open ends of the second panel by filling the continuous open gap with unitary foam rubber end closures to form a substantially fully enclosed area between said panels for providing an insulating air-space between said panels and each of said foam rubber end closures including a unitary seal with first and second surfaces which substantially conforms to the contacted surfaces of the first and second panels to extend into said corrugations formed in the first and second panels and into contact with the opposed surfaces of the first and second panels; and
securing the first and second end closures to the first and second panels with contact-type adhesive.

3,960,626

METHOD OF MAKING HIGH PERFORMANCE ABLATIVE TAPE

James L. Casadevall, Orlando, Fla., assignor to Martin Marietta Corporation, Orlando, Fla.

Division of Ser. No. 105,135, Jan. 8, 1971, Pat. No. 3,726,751, which is a continuation-in-part of Ser. No. 672,673, Oct. 2, 1967, abandoned. This application Apr. 9, 1973, Ser. No. 349,906

Int. Cl.² B32B *7/08*

U.S. Cl. 156—93 **26 Claims**

1. A method for fabricating a nonwoven tape of high temperature fibers for use in high temperature applications comprising the steps of forming a plurality of elongate carrier fibers into an essentially aligned array, securing thereon in a nonwoven manner, a large plurality of cross fibers disposed essentially perpendicularly to said carrier fibers, with said cross fibers extending beyond said carrier fibers on at least one side to form a fringe, thus to create a pliable high temperature tape which can thereafter be wrapped for a number of turns about an item to be protected, with the fringe of cross fibers extending beyond the confines of the carrier fibers being available to provide a covering for one or more previous turns of such tape, and wrapping the tape, with the fringe intact, around a generally circular means.

3,960,627

MANUFACTURE OF GLAZING

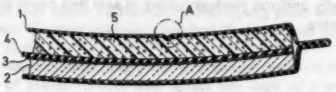
Friedrich Halberschmidt; Helmut Paulus, both of Herzogenrath, and Karl-Josef Feiten, Wuerselen, all of Germany, assignors to Saint-Gobain Industries, Neuilly-sur-Seine, France

Filed Sept. 30, 1974, Ser. No. 510,421

Claims priority, application France,

Int. Cl.² B32B *17/00, 31/00*

U.S. Cl. 156—104 **12 Claims**



1. A method of manufacturing a laminated glazing including a sheet of glass and a sheet of plastic adhered thereto which method comprises assembling into a stack in successive superposed relation the sheet of glass, the sheet of plastic, an elastic protective sheet and a cushion sheet of deformable material inserting the stack into a bag, reducing the pressure within the bag to a value below atmospheric, sealing the bag about the stack, thereafter raising the pressure outside the bag to a level above atmospheric and raising the temperature within the bag to a level above ambient, removing the stack from the bag, and separating the protective sheet and cushion sheet from the remainder of the stack.

3,960,628

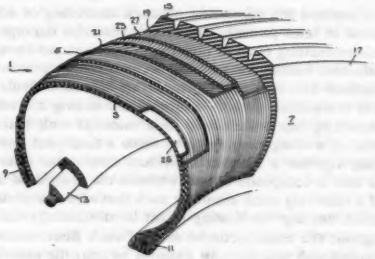
STEEL-BELTED RADIAL PLY TIRES WITH 0° TEXTILE CAP BAND

Robert H. Snyder, Grosse Pointe Park, Mich., assignor to Uniroyal Inc., New York, N.Y.

Division of Ser. No. 334,198, Feb. 21, 1973, Pat. No. 3,850,219, which is a continuation-in-part of Ser. No. 281,890, Aug. 18, 1972, abandoned. This application Mar. 12, 1974, Ser. No. 450,506

Int. Cl.² B29H *17/02, 17/14*

U.S. Cl. 156—123 **5 Claims**



1. In the method of making a radial ply tire having between the crown region of the carcass thereof and the surrounding tread a belt composed of at least two superposed plies of high modulus belt cords oriented at an angle of between about 16° and about 30° with respect to the median equatorial plane of the tire, with the belt cords being parallel to each other within each belt ply and being crossed with respect to cords in each next adjacent belt ply, wherein the carcass is built in substantially cylindrical form, said carcass is then shaped to toroidal form, and the belt and the tread are thereafter applied to the crown region of the shaped carcass preparatory to the placing

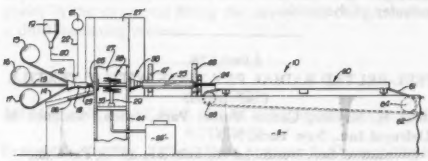
of the raw tire into the mold for curing; the improvement comprising the steps of incorporating between the radially outwardmost belt ply and the tread during the building operation a cap band having at least one layer which is at least as wide as the widest of said belt plies and has incorporated therein a plurality of textile cords oriented substantially parallel to one another and to said median equatorial plane, with said cap band in direct contact with the radially outwardmost one of said belt plies, placing said raw tire into a two-piece mold, and applying internal fluid pressure to said raw tire upon closing of the mold for expanding said raw tire fully into the mold contours and concurrently stressing said textile cords in said cap band to elongate by between about 1% and about 5% from their unstressed condition, said textile cords thereby exerting a restraining force on said belt plies to ensure substantially uniform pantographing of said belt cords during said expansion.

3,960,629

METHOD FOR INDUCTIVE HEAT CURING OF CONDUCTIVE FIBER STOCK

William Brandt Goldsworthy, 2504 Novato Place, Palos Verdes Estates, Calif. 90274

Filed Jan. 31, 1975, Ser. No. 545,924
Int. Cl.² B32B *31/26*; H05B *5/00*
U.S. Cl. 156—180 7 Claims



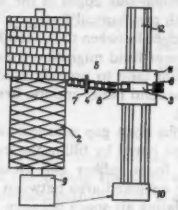
1. A method for the curing of stock consisting of a fiber strand of at least partially conductive material impregnated with thermosetting resin of nonconductive material by use of an inductive heating coil having loops extending around a longitudinal axis and productive of an inductive field, said method comprising initially continuously mixing a synthetic thermosetting liquid dielectric resin material with hardener material at a composing stage to form a catalyzed mixture, bringing together a mass of individual conductive fiber elements into a composite strand wherein the individual fibers are of a relatively small diameter such that when subjected to induction heating the heating effect is substantially uniform throughout the cross-sectional area of each fiber, saturating said strand with said mixture whereby to coat the exterior of the individual fibers with said resin material, orienting the longitudinal axes of said fibers in a selected direction, forming the saturated strand to a preselected cross-sectional shape and size, energizing said coil with an electric current, and passing the saturated strand through said inductive field with the axes of said fibers perpendicular to the axis of said coil, said current being one of a frequency of between about 60 Hertz and about 10 Megahertz the exact frequency chosen being dependent on work material size, shape and electrical properties and engineering considerations whereby to heat said fibers and pass heat from said fibers to said catalyzed mixture and initiate curing of said catalyzed mixture by heat generated in said fibers.

3,960,630

PROCESS AND APPARATUS FOR THE PRODUCTION OF WOUND SANDWICH STRUCTURES

Zsuzsa Pataki, nee Nagy; Ferenc Windisch; Jozsef Nagy; Geza Kecskemethy, and Gyorgy Virag, all of Budapest, Hungary, assignors to Muanyagipari Kutato Intezet and Fovarosi Muanyagipari Vallalat, both of Budapest, Hungary

Filed July 22, 1974, Ser. No. 490,884
Claims priority, application Hungary, July 25, 1973, MU 505
Int. Cl.² B65H *81/00*; B31C *9/00*
U.S. Cl. 156—190 7 Claims



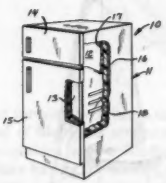
1. In a process for the production of wound sandwich structures from glass fiber-reinforced plastic, wherein an inner glass fiber-reinforced plastic layer is wound onto an annular shaping mandrel, and then a central core, and an outer glass fiber-reinforced layer are wound in succession thereover, and wherein the outer layer is subsequently cured, the improvement which comprises attaching a plurality of individual prefabricated nonfilamentary block-like core elements to a continuous carrier to form a continuous succession of said elements before the application thereof over the inner layer by helically winding said core elements over said inner layer.

3,960,631

METHOD OF MAKING A LINER CONSTRUCTION

Leonard E. Weiss, and Kenneth L. Hortin, both of Evansville, Ind., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Aug. 30, 1974, Ser. No. 502,006
Int. Cl.² B29F *3/00*; B32B *31/30*; C09J *7/00*; F25D *23/08*
U.S. Cl. 156—244 9 Claims

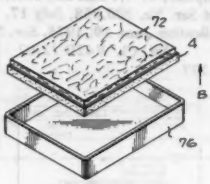


1. The method of fabricating a liner for a refrigeration appliance insulated cabinet wherein the insulation is foamed-in-place, comprising the steps of: providing a liner sheet having a surface portion to which foamed-in-place insulation adheres; adhering a foam release layer on said surface portion of said liner sheet, said release layer being preselected to permit only limited adhesion thereto of insulation foamed-in-place thereagainst; and forming said sheet with said layer thereon into a refrigerator liner configuration with said layer disposed outwardly to provide for a breakable bond between the liner sheet and insulation subsequently foamed-in-place about the formed liner configuration and thereby prevent stress cracking of the liner as a result of different thermal expansion characteristics of said insulation and said liner sheet material.

3,960,632
METHOD OF PREPARING A DISPENSING PAD FOR FINGERPRINTING REAGENTS

Jerome Gaines, Van Nuys, and Herbert M. Conrad, Santa Monica, both of Calif., assignors to Veriprint Systems Corporation, Chatsworth, Calif.

Filed Sept. 26, 1974, Ser. No. 509,326
Int. Cl.² B29C 5/00
U.S. Cl. 156—245 **10 Claims**

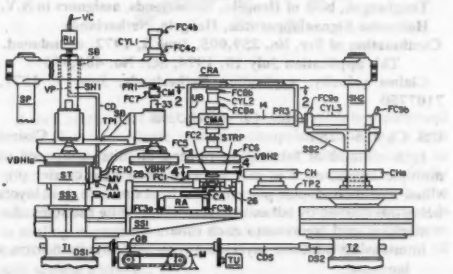


1. The method of preparing a dispensing pad for fingerprinting reagents, comprising the steps of:
preparing a plaster of Paris slurry;
dispersing sawdust in said slurry;
charging the slurry into a mold, and floating a layer of felt thereon;
allowing the slurry to set in said mold;
removing the hardened plaster matrix with the felt layer adhering thereto from said mold;
drying said matrix at an elevated temperature for a predetermined period;
preparing a reagent with metallic ions dispersed in a suitable solvent;
submerging said plaster matrix with the felt layer adhering thereto in said reagent to saturate said matrix and said felt layer therewith; and
inserting said pad into a fluid-tight pan with said plaster matrix exposed upwardly and said felt layer depending downwardly therefrom.

3,960,633
DECAL APPLYING

Mijo A. Gossie, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed June 12, 1975, Ser. No. 586,241
Int. Cl.² B44C 1/16
U.S. Cl. 156—247 **7 Claims**



1. A method of stripping the backing paper of water-soaked water-release slide-off decal from the transfer film of the decal and applying such film to a surface of a dish-like article, such soaked decal being initially supported by vacuum applied to said transfer film through the face of a first depending and vertically movable vacuum and blow head assembly located above and downwardly facing a decal stripping plate at a first position in a horizontal path of travel of such plate, such method comprising the steps of;

I. lowering said vacuum and blow head assembly towards said stripping plate and said decal into close proximity to the upper surface of such plate;

II. supplying vacuum through suitable slots provided in said upper surface of said stripping plate and thereby to said backing paper of said decal while terminating said vacuum to said vacuum and blow head assembly and supplying compressed air through such head to such decal, said vacuum supplied through said stripping plate and said air supplied through said head acting to transfer the decal to said upper surface of the stripping plate;

III. raising said vacuum and blow head assembly and terminating said compressed air and leaving said decal remaining on said upper surface of said stripping plate and held thereon by said vacuum supplied through said slots in such plate;

IV. moving said stripping plate to a second position in said path of travel thereof and under the face of a second depending and vertically movable vacuum and blow head assembly moving through a second horizontal path of travel toward said second position and downwardly facing such second path of travel;

V. supplying vacuum to said second vacuum and blow head assembly and lowering such head to move said face thereof into contact with said transfer film of said decal on said upper surface of said stripping plate to draw such transfer film towards said face of such second assembly while continuing to supply vacuum through such stripping plate to said backing paper of the decal to hold such backing paper to the plate;

VI. moving said stripping plate towards its said first position in said first path of travel and raising and moving said second vacuum and blow head assembly through said second horizontal path of travel towards a third position located above a chuck holding a dish-like article upon whose upper surface said transfer film is to be applied, such movements stripping such transfer film and said backing paper from each other;

VII. continuing the movement of said stripping plate to said first position in said path of travel thereof while terminating said supply of vacuum to such plate and supplying compressed air through suitable orifices in said upper surface of the plate to aid in removal of said backing paper of said decal from said stripping plate;

VIII. continuing the movement of said second vacuum and blow head assembly and said transfer film carried thereby through said second horizontal path of travel to said third position;

IX. lowering said second vacuum and blow head assembly adjacent to said surface of said dish-like article and then terminating the vacuum and supplying compressed air through said face of such head to said transfer film to aid in applying, in conjunction with a vertically movable center plug member of the second vacuum and blow head assembly, such transfer film to the upper surface of said dish-like article;

X. raising said second vacuum and blow head assembly and terminating said compressed air supplied thereto; and

XI. repeating steps I through III while moving said second vacuum and blow head assembly through said second path of travel towards said second position for subsequent receipt of the transfer film of another decal from said stripping plate moving through said first path of travel from said first position to such second position as in step IV.

2. In an apparatus including a first turret machine having a vertically actuable and rotatable tool plate carrying a first vacuum and blow head assembly for supporting on the bottom thereof, by vacuum supplied thereto, a water-soaked, water-release, slide-off decal, and a second rotatable turret machine having a tool plate carrying a chuck holding a dish-like article upon whose upper surface the transfer film of said decal is to

be applied, such turret machines being spaced from each other a predetermined distance and driven in synchronization with each other; the combination comprising;

I. first actuable valve means for supplying vacuum through the bottom of said first assembly for supporting said decal when said tool plate of said first turret machine is in its raised position;

II. means for actuating said first valve means to terminate said vacuum when said tool plate of said first machine is in its lowered position;

III. second actuable valve means for at times supplying compressed air to said first assembly and through the bottom thereof to said decal;

IV. a decal stripping plate having in its upper surface a plurality of vacuum slots and a plurality of compressed air orifices;

V. third and fourth actuable valve means for at different times supplying vacuum and compressed air through said slots and said orifices, respectively, of said stripping plate;

VI. first motor means for at times moving said stripping plate through a first horizontal path of travel extending between a first position below said first vacuum and blow head assembly and a second position;

VII. a second vacuum and blow head assembly movable through a second horizontal path of travel between said second position and above said stripping plate when at such position, and a third position above said chuck carried by said tool plate of said second turret machine;

VIII. second motor means for at times moving said second assembly between said second and third positions in said second horizontal path of travel;

IX. third motor means for at times raising and lowering said second assembly;

X. fifth and sixth actuable valve means for at different times supplying vacuum and compressed air, respectively, through the bottom of said second assembly; and

XI. a control system for selectively actuating said valve means and said motor means in synchronism with said turret machines to;

A. move said stripping plate to said first position and below said first vacuum and blow head assembly prior to a downward actuation of said tool plate of said first turret machine;

B. supply compressed air through the bottom of said first assembly when such assembly is moved to its lowered position by said tool plate of said first turret machine and simultaneously supply vacuum through said slots of said stripping plate, said decal being transferred to the upper surface of such plate by said compressed air and vacuum;

C. move said stripping plate to said second position and below said second vacuum and blow head assembly;

D. lower said second assembly into light contact with the transfer film of the decal on the upper surface of said stripping plate;

E. supply vacuum through the bottom of said second assembly and to the transfer film of the decal on said stripping plate;

F. move said stripping plate towards said first position and strip the backing paper of the decal from the transfer film thereof while leaving such transfer film supported on the bottom of said second assembly;

G. terminate the vacuum supplied to said slots in the upper surface of the stripping plate and supply compressed air through said orifices in such upper surface to raise said backing paper and permit such paper to be removed from the stripping plate;

H. raise said second vacuum and blow head assembly and moving such assembly through its horizontal path of travel to said third position above said chuck;

I. lower said second assembly to said chuck;

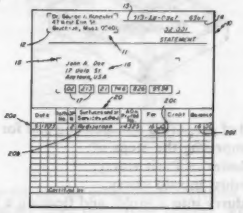
J. terminate the vacuum to said second assembly and supply compressed air through the bottom thereof to said decal to transfer said transfer film of the decal to the upper surface of said dish-like article carried by said chuck; and

K. raise said second assembly and move it through its horizontal path of travel towards said second position in preparation for receipt of the transfer film of another decal being moved to such second position by said stripping plate.

3,960,634
METHOD OF MAKING RECORDS

George A. Kempster, 47 W. Elm St., Brockton, Mass. 02401

Continuation of Ser. No. 380,058, July 17, 1973, abandoned.
This application June 19, 1975, Ser. No. 588,419
Int. Cl.² B42D *12/02*
U.S. Cl. 156—277 1 Claim



1. A method of making records that consists of the steps of providing a master sheet including a top portion having permanent indicia identifying a doctor and a patient and a bottom section having an area of permanent indicia establishing lengthwise columns for use in recording services performed by the doctor, photocopying said master sheet after performed services are recorded thereon, providing an extension sheet of the size and shape as said area and having identical indicia on its face for recording services subsequently performed by the doctor for the identified patient, and then, before the recording of said subsequent services, adhesively securing said extension sheet on said bottom portion in a position in which its indicia is an exact replacement of the now covered area, and thereafter photocopying the modified master sheet with the copy appearing as that of a first used master sheet.

3,960,635
METHOD FOR THE FABRICATION OF PRINTED CIRCUITS

Dick La Roy, and Erik Adriaan Willem Van Ebbenhorst Tengbergen, both of Hengelo, Netherlands, assignors to N.V. Hollandse Signaalapparaten, Hengelo, Netherlands

Continuation of Ser. No. 259,005, June 2, 1972, abandoned.
This application July 10, 1974, Ser. No. 486,976
Claims priority, application Netherlands, June 7, 1971, 7107750
Int. Cl.² C09J *5/06*
U.S. Cl. 156—286 2 Claims

1. A method of fabricating printed circuits composed of multiple layers, each of said layers formed by a carrier provided with a conductor pattern on at least one side, said layers being interleaved by adhesive layers, comprising the steps of:

stacking said layers onto each other;

interleaving adhesive layers between said layers to form a laminate;

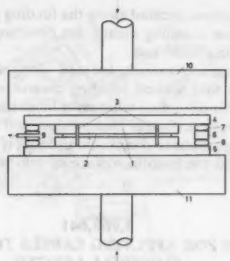
clamping the laminate together;

evacuating the air from the space where the laminate is situated;

maintaining evacuation of the air during a first period of time such that moisture and air are extracted from the laminate;

pressing the laminate together under a first pressure while maintaining said evacuation during a second period of

time, and increasing the temperature of the laminate during said second period, a rate of increase of temperature and duration of the second period being such that the adhesive melts and fills any voids between the layers and that during said second period said temperature remains below a value at which components of the adhesive required for hardening will be extracted, during said second



period said first pressure being below a value at which the adhesive layers are pressed out of the laminate;

then admitting air into the space where the laminate is situated; and

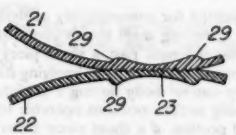
pressing the laminate under a further increase in pressure for a third period of time while increasing the temperature of the laminate to a predetermined maximum value such that said adhesive hardens.

3,960,636

METHOD AND APPARATUS FOR THE PRODUCTION OF SHEAR SEALS IN THERMOPLASTIC MATERIALS

Myron L. Moffitt, Fairport, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed June 19, 1974, Ser. No. 480,994
Int. Cl.² B32B *31/00*
U.S. Cl. 156—290 **2 Claims**



1. In a method for heat sealing together multiple superposed layers of thermoplastic material comprising bringing a heat sealing element into sealing engagement with said layers to effect sealing, the improvement which comprises laterally displacing a portion of said thermoplastic material in the heatseal area with said heat seal element while said element is in sealing engagement with said layers, said lateral displacement of material being achieved by lateral displacement of said sealing element.

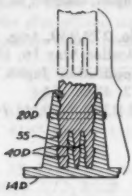
2. Heat sealing apparatus comprising a resilient support surface, a heat sealing element adapted for sealing engagement in a seal area, multiple layers of thermoplastic supported on said support surface and displacement means to laterally displace molten portions of said layers in said seal area during sealing engagement of said sealing element, said displacement means comprising means to laterally displace said heat-seal element.

3,960,637

COMPOSITE STRUCTURAL MEMBER

Paul F. Ostrow, 3170 SW. Fairmount Blvd., Portland, Oreg. 97201

Filed July 23, 1973, Ser. No. 381,912
Int. Cl.² E04C *3/292*
U.S. Cl. 156—293 R **3 Claims**



1. A method of making an elongate building component comprising a web element and an elongate flange element united to an edge margin of said web element, the method comprising

providing a flange element with an elongate channel defined along a side thereof, said channel, progressing toward the base of the channel from the top thereof having sides that converge on each other to form opposed pads in one elongate zone extending the length of the channel and that thence diverge in a region spaced toward the base of the channel from said zone,

providing a web element with an edge margin which is compressible in a direction normal to the sides thereof, which edge margin is of lesser thickness than the width at the top of the channel but has a greater thickness than the width of the channel in said zone of opposed pads,

introducing adhesive to one of said elements whereby such will reside in said channel with said edge margin seated in said channel,

inserting said edge margin into said channel by forcing such laterally into the channel to seat the edge margin with such extending past said zone of said pads, and

as a result of said insertion, and with the edge margin so seated, permanently compressing the edge margin of said flange element with said pads, where the edge margin extends across the zone of said pads, to a thickness which is less than the original thickness of said edge margin and less than the thickness of the edge margin on either side of said pads.

3,960,638

PROCESS FOR SEPARATING A NUMBER OF SHEETS INTO GROUPS

Yasuhiro Ogata, and Takao Hayashi, both of Fujimiya, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

No Drawing. Filed Dec. 11, 1974, Ser. No. 531,497
Claims priority, application Japan, Dec. 28, 1973, 49-506
Int. Cl.² B41L *1/24*
U.S. Cl. 156—305 **11 Claims**

1. A process for separating a number of pressure sensitive copying papers into groups which comprises (1) coating an adhesive composition comprising a naphthalene sulfonic acid-formaldehyde condensation product, a water-soluble polymer material, and a water-soluble metal salt, on an edge of a stack assembly of said copying papers and then (2) fanning said copying papers; said naphthalene sulfonic acid-formaldehyde condensation product comprising about 5 to 40% by weight of the adhesive composition, said water-soluble polymer, which is selected from the group consisting of a natural polymer, a semi-systhetic polymer and a synthetic polymer, comprising about 0.1 to 20% by weight of the adhesive composition, and said water-soluble metal salt, which consists of a salt of a metal

selected from the group consisting of a univalent metal, a divalent metal and a trivalent metal, comprising about 0.1 to 6% by weight of the adhesive composition.

3,960,639

METHOD OF MAKING A LAMINATED METAL-BASED FACING

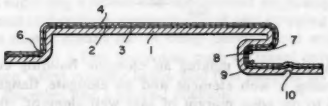
Shinji Kudo, Osaka, Japan, assignor to Yodogawa Steel Works, Limited, Japan

Division of Ser. No. 279,930, Aug. 11, 1972, Pat. No. 3,870,594. This application May 16, 1974, Ser. No. 470,364

Claims priority, application Japan, Aug. 16, 1971, 46-62219; Mar. 24, 1972, 47-30151

Int. Cl.² B32B 5/00, 15/14, 21/08

U.S. Cl. 156—222 **5 Claims**



1. A method of manufacture of a laminated metal-based facing capable of being bent without cracking or separating due to the bending and useful as an interior finishing or building material, said method comprising the steps of laying a resin adhesive layer on at least one side of a metal sheet having a thickness of 0.4–1.0 mm as base and subsequently laying a veneer of natural wood of 4–10% by weight of moisture content and a thickness of 0.1–0.9 mm over the surface of said resin adhesive layer, said adhesive layer being non-woven cloth of non-binder construction obtained from synthetic resin fiber and impregnated with a thermoplastic phenol resin adhesive having less than 60 mol % of phenol resin groups and which is flexible and adheres to the metal sheet, forming said laminated materials into one body by heating at a temperature of 100°–160°C under a pressure of 8–20 kg/cm² to bond the veneer to the metal sheet, and bending portions of the resulting laminate into desired configuration without causing the laminations to crack or separate.

3,960,640

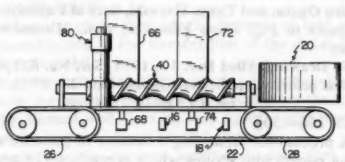
BOTTOM LABELING APPARATUS

Paul R. Mort, Jr., and Robert A. Cleary, both of Yonkers, N.Y., assignors to Syncro-Motion Corporation, Yonkers, N.Y.

Filed May 13, 1974, Ser. No. 469,549

Int. Cl.² B65C 9/06

U.S. Cl. 156—351 **8 Claims**



1. An apparatus for bottom labeling a product, comprising:

feeding means for conducting a product along a predetermined feeding path;

said feeding means including means supporting the product with the bottom surface thereof movable along said feeding path;

first labeling means, located along the feeding path, for applying a label to said bottom surface of said product fed past said first labeling means;

second labeling means for applying a label to said bottom surface of said product, said second labeling means being spaced downstream from said first labeling means along the feeding path;

first scanning means, located between said first and second labeling means along the feeding path, for detecting whether a label has been applied to said bottom surface of said product at the first labeling means and for actuating said second labeling means if the label has not been applied;

diverting means, located along the feeding path downstream of the first scanning means, for diverting a product from the feeding path; and

second scanning means, located along the feeding path between said second labeling means and said diverting means, for detecting whether a label has been applied to said bottom surface of said product and for actuating said diverting means to divert said product if no label has been applied to the bottom surface of said product.

3,960,641

MEANS FOR APPLYING LABELS TO A SHEET MATERIAL LENGTH

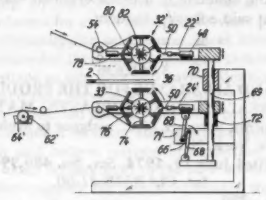
Henning Kristen Pedersen, Vejle, Denmark, assignor to Gert Oestergaard, Vejle Plastic, Denmark

Filed Nov. 7, 1972, Ser. No. 304,409

Claims priority, application United Kingdom, Nov. 11, 1971, 52412/71

Int. Cl.² B65C 9/42

U.S. Cl. 156—362 **29 Claims**



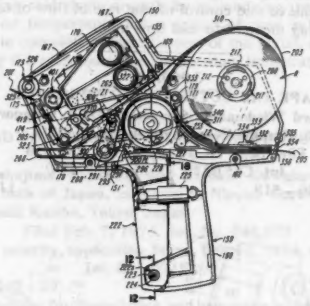
21. A machine for consecutively applying pieces of sheet material to a moving sheet length comprising means for advancing a sheet length past a sheet piece applying station, applicator means located in said applying station and comprising a rotary carrier body having a peripheral row of sheet piece carrying surface portions operable to temporarily hold a front end portion of a sheet piece material strip and wind said material strip partly onto said carrier body in response to rotation thereof, cutting means for consecutively cutting the strip material between two successive of said surface portions so as to consecutively form a cut off sheet piece held by the leading one of said two successive surface portions, means for reciprocating said carrier body between a position in which said carrier body is spaced from the surface of said sheet material length and an applicator position in which the leading surface portion of said carrier body is pressed against the surface of the material length to transfer the sheet piece temporarily held by said leading surface portion to the surface of the sheet material length, and means for rotating said carrier body step-wise so that a successive surface portion of said carrier body is pressed against the surface of said material length each time said carrier body is moved to said applicator position, said means for advancing the sheet material length being controlled so as to advance the sheet material length during at least a part of the time interval when the carrier body is out of pressing contact with the surface of the material length.

3,960,642

APPARATUS FOR PRINTING AND APPLYING PRESSURE SENSITIVE LABELS

Paul H. Hamisch, Jr., Franklin, and James A. Makley, West Carrollton, both of Ohio, assignors to Monarch Marking Systems, Inc., Dayton, Ohio

Filed June 5, 1974, Ser. No. 476,649
Int. Cl.² B32B *31/00*
U.S. Cl. 156—384 **6 Claims**



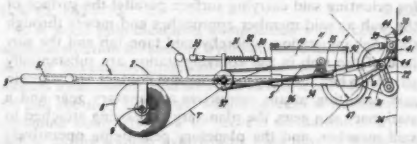
1. Apparatus for printing and applying pressure sensitive labels carried on a web of supporting material, comprising: a frame, a platen and a cooperable print head mounted for relative movement on the frame, a delaminator for delaminating printed labels carried on the supporting material web, an applicator for applying the printed labels, means in contact with the web for feeding the labels successively into printing cooperation with the platen and the print head and to effect delamination of the printed labels, means for driving the print head and the feeding means including first and second meshing gear sections, and a selectively positionable eccentric support for the first gear section to enable precise meshing of the gear sections.

3,960,643

DRY WALL TAPING DEVICE

Arthur Z. Dargitz, 965 McClatchy Way, Sacramento, Calif. 95815, and Lawrence A. Dargitz, 21161 S. Wagner Road, Ripon, Calif. 95366

Filed Jan. 13, 1975, Ser. No. 540,662
Int. Cl.² B32B *31/00*; B44C *7/04*, *7/08*
U.S. Cl. 156—390 **12 Claims**



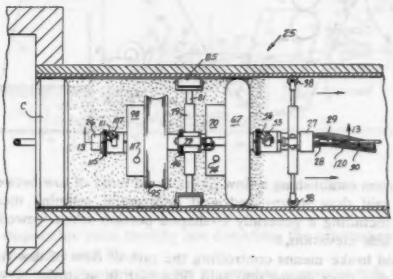
1. A dry wall taping device, comprising a hand-supported and manipulated frame having a handle portion at a first end and a tape applying end portion at a second opposite end for projection by an operator into close proximity to a dry wall having a seam, for applying glue to a dry wall tape, securing the glued tape to a dry wall and plastering over the secured tape in generally immediate succession, and including means to support a roll of tape in position for the tape to pay out and run to the tape applying end of the frame, means intermediate the tape roll support and the tape applying end to apply glue to at least one side of said run of tape, a transverse axis tape applying roller at the tape applying end of the frame, means mounting the roller in position to engage said run of tape to roller-pressure glue-affix the tape over a seam upon dry wall traversing motion imparted to the frame by said operator and attendant paying out of said tape, a plaster extruding and smoothing head means for applying a layer of plaster of a predetermined controlled thickness at the tape applying end of the frame, means mounting said head means in connection with the frame whereby said head—when pressure-fed with plaster, and upon traversing motion of the frame—applies and smooths, in trailing relation to the tape applying roller, a finish layer of plaster over the glue-affixed tape, and means in part on the frame to feed plaster under pressure to said head.

3,960,644

PIPE LINING APPARATUS

Eldon C. McFadden, 4107 Norris Ave., Sacramento, Calif. 95821

Filed Sept. 25, 1974, Ser. No. 509,222
Int. Cl.² B05B *3/12*; B32B *1/08*, *1/10*
U.S. Cl. 156—390 **9 Claims**



1. A pipe lining apparatus for applying a lining to a pipe comprising a longitudinal non-rotating shaft, means for moving said shaft longitudinally through a liner in a pipe, a plurality of radially adjustable rollers mounted on said shaft with the axis of each of said rollers extending perpendicularly to the line of movement of said apparatus through said pipe for guiding said shaft through said pipe, spray means journalled on said shaft adjacent said rollers for spraying resin and catalyst onto said liner, means mounted on said shaft for rotating said spray means about said shaft, inflatable means mounted on said shaft adjacent said spray means for forcing the resin and catalyst into said liner, and a plurality of compression rollers, means mounting said compression rollers for rotation about said shaft with the axis of said compression rollers parallel to the axis of said pipe for compressing said liner against said pipe.

3,960,645

METHOD AND APPARATUS FOR THE OPENING OF TOW

Warren A. Brackmann, Cooksville, and Daniel Dilanni, Toronto, both of Canada, assignors to Rothmans of Pall Mall Canada Limited, Toronto, Canada

Filed Jan. 21, 1975, Ser. No. 542,715
Claims priority, application United Kingdom, Jan. 28, 1974, 3927/74
Int. Cl.² A24C *5/50*
U.S. Cl. 156—441 **11 Claims**

1. A tow opening mechanism comprising
differential gripping means for gripping selected portions only of the width of a band of tow material composed of a plurality of longitudinally-extending crimped fibres to achieve relative longitudinal shifting of adjacent fibres of the tow under the application of tension to the tow band upstream of said differential gripping means,

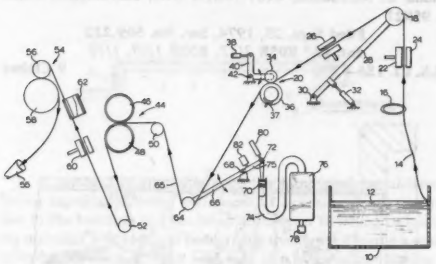
drag means located upstream of said differential gripping means and arranged to apply tension to the tow between said drag means and said differential gripping means,

said drag means comprising a first pair of upper and lower rollers mounted for free-wheeling rotation and arranged to grip tow passing through the nip between the rollers,

brake means operatively associated with at least one of said upper and lower rollers for applying a variable braking force to said at least one roller,

brake actuation means operatively connected to said brake means for actuation of said brake means,

means for controlling the pressure of one of said pair of rollers on the other to control the force applied to the tow passing through the nip between the rollers,



means establishing a flow path of said band of tow between said drag means and said differential gripping means including a generally U-shaped portion when viewed in side elevation,

said brake means controlling the rate of flow of tow from said drag means into said flow path in accordance with the speed of rotation of said upper and lower rollers,

an elongate substantially inertialess cylindrical member having its axis extending generally horizontally with said cylindrical member engaging the upper surface of the tow band in the trough of said generally U-shaped portion of said flow path whereby the axis of said cylindrical member extends laterally of said tow band, said cylindrical member forming part of said means establishing a flow path,

substantially inertialess lever arm means including a pair of arm members of substantially equal length passing one each side of the lateral edges of said tow band in said U-shaped portion,

means mounting said cylindrical member to said pair of lever arm members adjacent one end of said lever arm means,

pivot means located to the underside of one of the arms of the U-shaped tow band portion when viewed in side elevation and pivotally mounting said pair of lever arm members at a location remote from said one end thereof for arcuate movement of said pair of lever arm members about a substantially horizontal axis parallel to the axis of said cylindrical member,

force-producing means connected to said lever arm means at a position closer to said pivot means than said cylindrical member on the side of said pivot opposite said cylinder member for providing constant downward force on said tow band in said generally U-shaped portion through said cylindrical member, and

arcuate position sensing means including means engaging said lever arm means to detect the arcuate position of said lever arm means and thereby arranged to sense arcuate movement of said lever arm means,

variable output means actuated by said engagement means for producing an output signal corresponding in strength to the positions of said engagement means and hence corresponding to the arcuate position of said lever arm means,

said variable output means being inactive for predetermined positions of said engagement means corresponding to small angular displacements of said lever arm means and active for positions of said engagement means other than said predetermined positions corresponding to larger angular displacements of said lever arm means, and

means operatively connecting said variable output means to said brake actuation means for activation of said brake means to apply said braking force to said at least one roller corresponding to the strength of said output signal and achieve said control of said rate of flow of tow from said drag means into said flow path.

3,960,646

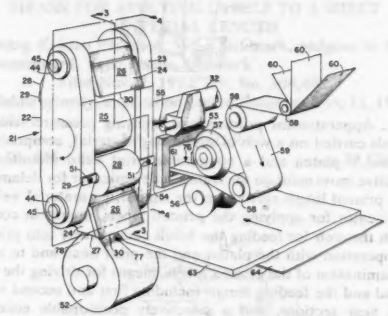
TAPE TAB CUTTER AND APPLICATOR

Karl Edward Wiedamann, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Sept. 18, 1972, Ser. No. 289,898

Int. Cl.² B32B *31/00*; B31F *1/00*

U.S. Cl. 156—518 **11 Claims**



1. An apparatus for applying tape tabs at spaced intervals on the surface of a continuously moving web as the web passes through a tape tab applying station, comprising:

a. an orbitable, rotatable, tape tab handling member having a generally flat tape tab carrying surface;

b. grip means associated with the carrying surface for holding the tape tab in contact with said carrying surface;

c. orbit means operatively associated with said member for moving said member through an orbital path which approximates the plane and the velocity of the web at the applying station; and

d. orienting means operatively associated with said member for orienting said carrying surface parallel the surface of the web as said member approaches and moves through the applying station, whereby said tape tab and the surface of the web in the applying station are substantially parallel when they approximate and contact and wherein said orienting means comprises a planetary gear and a stationary sun gear, the planetary gear being attached to said member, and the planetary gear being operatively associated with the sun gear.

3,960,647

METHOD OF GROWING SINGLE CRYSTALS

Jacqueline Faure, Jarrie; Yves Malmejac, St-Egreve, and Bernard Schaub, Grenoble, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed May 30, 1974, Ser. No. 474,647

Claims priority, application France, May 30, 1973, 73.19849

Int. Cl.² B01J *17/02*

U.S. Cl. 156—603 **5 Claims**

1. A method of growing single crystals of a metal which exhibits an allotropic change of state at a temperature below

its melting point to produce single crystals which are practically free from misorientation, comprising:

single crystals of the raw metal which has undergone an unidirectional solidification to a first temperature between the allotropic transformation point and the melting point of the metal,

maintaining the single crystals for a predetermined period of time in the vicinity of said first temperature,

cooling the single crystals to a second temperture below the allotropic transformation point,

annealing said single crystals by maintaining them at said second temperature for a period of time sufficient to obtain complete recrystalization of the metal, and

cooling the recrystalized metal to room temperature.

3,960,648

METHOD FOR TREATING PULP-CONTAINING WASTE LIQUORS

Mikio Nakajima, Fujisawa, and Kiyoaki Kuwabara, Yokohama, both of Japan, assignors to Nippon Carbide Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 7, 1975, Ser. No. 548,073

Claims priority, application Japan, Feb. 13, 1974, 49-16763

Int. Cl.² D21F *1/82*

U.S. Cl. 162—29 **8 Claims**

1. A process for flocculating and removing turbid components of pulp-containing waste liquor from paper-making processes comprising:

A. adjusting the pH of the waste liquor so that it has an acid pH; then

B. adding and mixing from about 1 to about 50 parts by weight per 1,000 parts by weight of turbid components in the waste liquor of a dicyandiamide-formaldehyde resin with the waste liquor; and then

C. adding and mixing at least about 100 parts by weight per 1,000 parts by weight of turbid components in the waste liquor of aluminum sulfate whereby the turbid components of the waste liquor are flocculated; and then

D. separating and removing the resultant flocculated material.

3,960,649

WOOD PULP BLEACHING COMPOSITION CONTAINING SODIUM HYDROSULFITE AND HEXAMETHYLENETETRAMINE

Edward A. Sullivan, Beverly, Mass., assignor to Ventron Corporation, Beverly, Mass.

Division of Ser. No. 511,940, Oct. 3, 1974, abandoned. This application Apr. 18, 1975, Ser. No. 569,241

Int. Cl.² D21C *9/10*

U.S. Cl. 162—72 **8 Claims**

1. A wood pulp bleaching composition which comprises an aqueous solution for sodium hydrosulfite, and at least 2 weight percent hexamethylenetetramine based upon the weight of sodium hydrosulfite, said solution having a pH between about 5.0 and about 11.0 and said weight percent of hexamethylenetetramine being effective to prevent formation of hydrogen sulfide during sodium hydrosulfite bleaching of wood pulp.

3,960,650

MACHINE AND METHOD FOR MAKING A LAMINATE STRUCTURE

Dewey P. Parks, Orange City, Fla., and Charles R. Scott, Sugar Grove, Va., assignors to Brunswick Corporation, Skokie, Ill.

Filed Jan. 13, 1975, Ser. No. 540,494

Int. Cl.² D21D *3/00*

U.S. Cl. 162—103 **12 Claims**

1. A method of making a laminated sheet comprising the steps of:

a. providing a roll of foraminous material mounted on a spool;

b. unwinding the material from the spool in a first direction;

c. pre-moisturizing the material with a liquid solution;

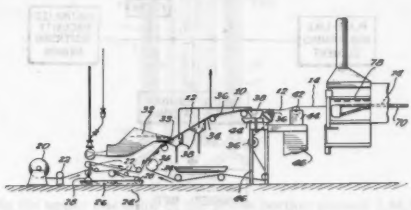
d. backing the pre-moistened material with a fourdrinier screen;

e. feeding the pre-moistened material to a fourdrinier head box;

f. depositing at a preselected controlled rate a slurry of liquid and fibers onto the material;

g. withdrawing by suction the liquid through the material and the screen leaving a substantially two dimensional randomly dispersed array of fibers on the upper side of the material;

h. impregnating, from underneath, the material and the fibers on the upper side of the material with a liquid



dispersible resin thereby not disturbing the orientation of the dispersed fiber;

i. continuously stretching the material at approximately 90° to its first direction of travel;

j. preheating the fiber coated resin impregnated laminate material to a temperature sufficient to remove part of the liquid;

k. heating the laminate material to a sufficient temperature to remove the remaining liquid and cure the resin;

l. compressing the laminate to a desired thickness with heat rollers;

m. inspecting the cured laminate with a feedback arrangement to control the rate of fiber deposition; and,

n. respooling the laminate.

3,960,651

REINFORCED AIR-PERVIOUS POLYTETRAFLUOROETHYLENE SHEET

Yutaka Kometani; Shun Koizumi, both of Toyonaka; Kazuo Kubota, Sulin, and Takeaki Nawazima, Toyonaka, all of Japan, assignors to Daikin Kogyo Co., Ltd., Osaka, Japan

Continuation of Ser. No. 154,606, June 18, 1971, abandoned, which is a division of Ser. No. 35,285, May 6, 1970, Pat. No. 3,629,383, which is a continuation-in-part of Ser. No. 403,367, Oct. 12, 1964, Pat. No. 3,528,879. This application Aug. 16, 1973, Ser. No. 388,724

The portion of the term of this patent subsequent to Sept. 15, 1987, has been disclaimed.

Int. Cl.² B32B *15/02*

U.S. Cl. 162—105 **1 Claim**

1. A reinforced air-pervious sheet consisting predominantly of a polytetrafluoroethylene fibrous powder having an average fiber length of 100 to 5000 microns, an average shape factor of not less than 10, and an anisotropic expansion factor of 1.30 to 7.00 adhered by means of molten polytetrafluoroethylene to a liquid-pervious member selected from the group consisting of wire net and metallic wool web, said liquid-pervious member being capable of retaining its original form even when heated to a temperature of 270° to 380°C.

3,960,652

PROCESS OF FORMING WET LAID TUFTED NONWOVEN FIBROUS WEB AND TUFTED PRODUCT

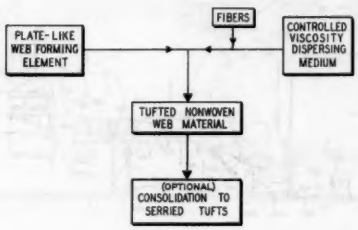
Bernard W. Conway, Holyoke, Mass., and James Moran, Simsbury, Conn., assignors to The Dexter Corporation, Windsor Locks, Conn.

Continuation-in-part of Ser. No. 341,699, March 15, 1973, Pat. No. 3,834,983. This application July 17, 1974, Ser. No. 489,411

The portion of the term of this patent subsequent to Sept. 10, 1991, has been disclaimed.

Int. Cl.[2] D21H 5/02, 5/26

U.S. Cl. 162—108 20 Claims



1. A process from producing a tufted nonwoven waterlaid fibrous web material comprising the steps of providing a plate-like, fiber-collecting element having a smooth fiber collecting surface and a multitude of apertures extending from said surface continuously through said element, each of said apertures having a lip portion at said surface and a generally tubular configuration through said element, providing a dispersion of fibers suited for being dispersed in an aqueous medium at a fiber concentration of at least about 0.01 percent by weight and depositing the fibers from said dispersion on the fiber collecting element to promote laminar flow of the aqueous fiber dispersing medium through the tubular apertures in said plate-like element and thereby form a tufted nonwoven fibrous web material on said element, said web having integral tufts formed from bundles of closely associated individual fibers extending over said lip portion and into the apertures in said element but not more than a minor portion of said tufts extending beyond the bottom of said element thereby preventing entanglement of adjacent tufts.

19. A process for producing a tufted nonwoven fibrous web material comprising the steps of providing a plate-like, fiber-collecting element having a smooth fiber collecting surface and a multitude of apertures extending from said surface continuously through said element, each of said apertures having a lip portion at said surface and a generally tubular configuration through said element, providing a fluid dispersion of fibers and depositing the fibers from said dispersion on the fiber collecting element to promote laminar flow of the fluid fiber dispensing medium through the tubular apertures in said plate-like element and thereby form a tufted nonwoven fibrous web material on said element, said web having integral tufts formed from bundles of closely associated individual fibers extending over said lip portion and into the apertures in said element but not more than a minor portion of said tufts extending beyond the bottom of said element thereby preventing entanglement of adjacent tufts.

3,960,653

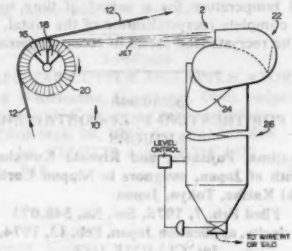
DOWNFLOW CONTROL SYSTEM FOR WEB MAKING MACHINES

Ralph James Futcher, Beaconsfield, and Alexander Malashenko, Dollard des Ormeaux, both of Canada, assignors to Dominion Engineering Works, Limited, Lachine, Canada

Continuation-in-part of Ser. No. 362,083, May 21, 1973, abandoned. This application Dec. 5, 1974, Ser. No. 529,749

Int. Cl.[2] D21F 1/68

U.S. Cl. 162—264 1 Claim



1. A downspout device in combination with a paper machine for transferring to a white water tank at a lower level liquid flowing as a high velocity liquid jet at substantially atmospheric pressure together with significant quantities of air and vapourous components in partially separated relation therewith, said jet being directed by the machine substantially horizontally out of the machine towards the device at a first level for subsequent flow of the liquid in a substantially non-cascaded condition at a second level below said first level, comprising a tube having an upper end, a lower end, and a substantially unobstructed interior extending between said first and second levels, having water entry means at said first level spaced from said upper end of the tube to provide an air space within the tube extending above said entry means, and to receive said liquid and air, said entry means having a downwardly sloping lower surface to impart a downward component of liquid flow velocity, said entry means being located in off-centered relation to the main longitudinal axis of said tube, to provide in operation a tangential flow component to liquid entering the downspout device and to permit unobstructed up draft of said air and vaporous components entering through said entry means, a first outlet from said tube, located at said second level and a second substantially unrestricted outlet in said tube, located above said entry and connecting with said air space, to receive in operation an air and water vapour up-draft at substantially atmospheric pressure, including air separated from said liquid by the centrifuge effect of high velocity rotation of said liquid flowing over the inner surface of the tube and downwardly along the downspout device.

3,960,654

SHEAR PUMP HEADBOX

Girard L. Calehuff, Hollidaysburg, Pa., assignor to Westvaco Corporation, New York, N.Y.

Filed Aug. 19, 1974, Ser. No. 498,559

Int. Cl.[2] D21F 1/18

U.S. Cl. 162—342 4 Claims

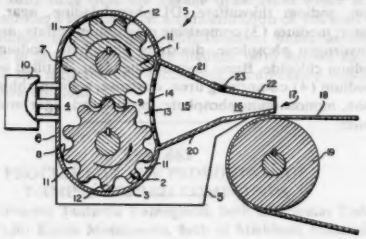
1. In a papermachine, a headbox for delivering paper making stock to said papermachine, said headbox having a top wall, bottom wall and side walls, an inlet manifold connected to one side of said headbox and a discharge manifold connected to another side of said headbox the improvement comprising:

a. a positive displacement shear pump means mounted for rotation and enclosed within a walled housing located in said headbox and extending between the side walls of said headbox, said shear pump means further comprising a

pair of meshed lobed rotors the lobes of which pass in close proximity to the walls of said housing with a substantially uniform clearance from said housing walls so as to provide when rotating travelling cavities bounded by individual adjacent lobes and the walls of said housing;

b. means at the inlet manifold side of said headbox forming a stock receiving chamber bounded at two sides by the tangent points formed by the lobes of the rotors and the housing and at the other two sides by the nip point formed by the interface between the lobed rotors and the inlet manifold;

c. means at the discharge manifold side of said headbox forming a stock distributing chamber bounded at two sides by the tangent points formed by the lobes of the rotors and the housing and at two other sides by the nip



point formed by the interface between the lobed rotors and the discharge manifold; and,

d. means for driving said positive displacement shear pump to pump paper making stock from the inlet manifold of the headbox to the discharge manifold of headbox through the stock receiving chamber and stock distributing chamber by producing a difference in pressure between the stock receiving chamber and the stock distributing chamber when individual lobes of said lobed rotors separate from their meshed condition at the stock receiving side of said housing to accept papermaking stock and form travelling cavities of stock, which cavities are subsequently voided when the lobes later intermesh to discharge the stock contained therein into the discharge chamber.

3,960,655

NUCLEAR REACTOR FOR BREEDING U^{233}

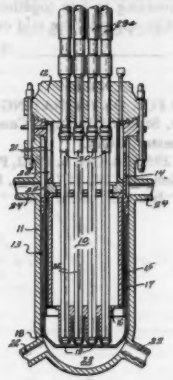
Charles S. Bohanan, Raleigh, N.C.; David H. Jones, Pittsburgh, Pa.; Harry F. Raab, Jr., Annandale, Va., and Alvin Radkowsky, Tel Aviv, Israel, assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed July 9, 1974, Ser. No. 486,786

Int. Cl.² G21C *1/00, 19/00*

U.S. Cl. 176—18 **1 Claim**

1. A light-water-cooled nuclear reactor for use in breeding U^{233} for use in a light-water breeder reactor comprising a core incorporating regions containing U^{235} fuel and U^{238} fertile material, the initial hydrogen-to-U^{235} atomic ratio therein being between 10.0 and 150.0 and the initial U^{236} to U^{238} ratio being between 0.005 and 0.20, said U^{235} fuel and U^{238} fertile material being contained in longitudinally movable seed assemblies, said seed assemblies consisting of hexagonal clusters of rods containing uranium dioxide, the upper third thereof containing 1.458 weight percent U^{235}, the middle third containing 2.914 weight percent U^{235} and the bottom third containing 10.194 weight percent U^{235} and regions containing Pu^{239} fuel and Th^{232} fertile material, the initial plutonium-to-hydrogen atomic ratio therein being between 0.0 and 0.015 with an equilibrium ratio between 0.002 and 0.015 and the initial plutonium-to-Th^{232} ratio being between 0.0 and 0.03 with an equilibrium ratio between 0.005 and 0.03, said Th^{232} fertile material and Pu^{239} fuel being contained in blanket assemblies consisting of a hexagonal array of rods containing ThO_2 and PuO_2 arranged in six concentric rows around a seed assembly, the innermost row containing in the active portion thereof 0.473 weight percent Pu^{239}, the next row containing in the active portion thereof 0.947 weight percent Pu^{239} in the upper five-sixths thereof and 0.473 weight percent Pu^{239} in the lower one-sixth thereof and the remaining four rows containing in the upper one-third of the active portion thereof 2.362 weight percent Pu^{239}, in the next one-sixth thereof 1.655 weight percent Pu^{239}, in the next one-third thereof 0.447 weight percent Pu^{239} and in the bottom one-sixth thereof 0.473 weight percent Pu^{239}, the seed rods being capped with natural uranium dioxide and the blanket rods being capped with ThO_2.



3,960,656

PEBBLE-BED REACTOR

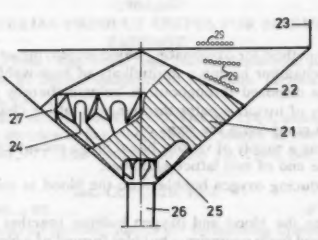
Günter Lohnert; Ulrich Müller-Frank, both of Bensberg, and Jürgen Heil, Bensberg-Moitzfeld, all of Germany, assignors to Interatom, Internationale Atomreaktorbau GmbH, Bensberg, Cologne, Germany

Filed Feb. 13, 1975, Ser. No. 549,779

Claims priority, application Germany, Nov. 29, 1974, 2456405

Int. Cl.² G21C *3/44*

U.S. Cl. 176—58 PB **2 Claims**



1. A pebble-bed nuclear reactor or large power rating, comprising a container have a funnel-shaped bottom forming a pebble run-out having a centrally positioned outlet, a bed of downwardly-flowing substantially spherical nuclear fuel pebbles in said container and forming a reactive nuclear core maintained by feeding said pebbles to the bed's top surface while used pebbles run out down said bottom forming said run-out and discharge through said outlet, a substantial conical body having a periphery of less extent than that of said container, and means for positioning said body in said run-out with the body's apex pointing upwardly and the body's said

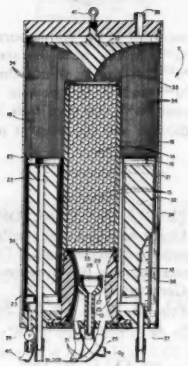
periphery horizontally spaced from said container's periphery and so as to permit said pebbles to flow under said body on said funnel-shaped bottom to and through said outlet, said means being formed by a plurality of mutually interspaced columns extending from said bottom upwardly to said body and said columns being radially elongated to form webs converging towards said outlet, said webs being shaped to define groups of radial passages extending from said peripheries to said outlet and converging to join together to form a single common passage while approaching said outlet.

3,960,657

METHOD FOR OXYGENATING BLOOD

Wallace W. Bowley, Stafford Springs, Conn., assignor to Intech, Inc., Manchester, Conn.

Division of Ser. No. 295,724, Oct. 6, 1972, Pat. No. 3,898,045.
This application July 24, 1975, Ser. No. 598,630
Int. Cl.[2] A61M 1/03
U.S. Cl. 195—1.8 6 Claims



1. A method for oxygenating blood employing an elongated lattice chamber having a multiplicity of immovable rounded surfaces disposed throughout its volume thereby creating a plurality of tortuous paths through said lattice chamber, said method comprising the steps of:

flowing a supply of venous blood into a receptacle adjacent one end of said lattice chamber;

introducing oxygen bubbles into the blood in said receptacle;

mixing the blood and oxygen bubbles together to form a blood foam comprising bubbles formed of a blood surface surrounding a volume of oxygen;

flowing the blood foam substantially unidirectionally through said lattice chamber whereby said blood surfaces of said blood foam bubbles collide with a multiplicity of said rounded surfaces in moving, frictional, wiping contact therewith, thereby resulting in the transfer of oxygen to said blood surfaces from the oxygen contained within said blood foam bubbles, whereby oxygenation of the venous blood is achieved; and

breaking down the oxygenated blood foam into oxygenated fluid blood and gases.

3,960,658

MULTI-MEDIA PETRI DISH

Souren Avakian, Westport, Conn., and Harry Seneca, Fort Lee, N.J., assignors to Centaur Chemical Co., Stamford, Conn.

Filed Sept. 23, 1974, Ser. No. 508,182
Int. Cl.[2] C12K 1/04, 1/10
U.S. Cl. 195—103.5 R 3 Claims

1. As an article of manufacture, a diagnostic kit for the rapid identification of uropathogenic bacteria which comprises a Petri-type dish which is structurally divided and contains in separate compartments culture media consisting of medium (1) comprising peptone, saccharose, lactose, dipotassium phosphate, eosin, methylene blue, agar, distilled water; medium (2) comprising peptone, beef extract, peptonized iron, sodium thiosulfate, DL-phenylalanine, agar, distilled water; medium (3) comprising magnesium sulfate, ammonium dihydrogen phosphate, disodium phosphate, sodium citrate, sodium chloride, Brom thymol blue, agar, distilled water; and medium (4) comprising urea, dextrose, sodium chloride, peptone, monosodium phosphate, phenol red, agar and distilled water.

3,960,659

TREATMENT OF PROTEINACEOUS MATERIAL

Stanley Fazakerley, Dollar, Scotland, assignor to The British Petroleum Company Limited, London, England

Filed Sept. 20, 1974, Ser. No. 507,716
Claims priority, application United Kingdom, Sept. 26, 1973, 45099/73
Int. Cl.[2] C12B 1/00
U.S. Cl. 195—5 5 Claims

1. A process for reducing the nucleic acid content of a yeast grown by submerged aerated fermentation in a broth containing a hydrocarbon substrate which process comprises the steps of:

a. separating a product stream containing the grown yeast to obtain (1) a yeast cell fraction and (2) an aqueous fraction having ribo-nuclease activity,

b. precipitating protein from said yeast cell fraction and,

c. contacting said precipitated protein with said aqueous fraction of step (a) (2) at a pH of 4.5 to 6 and a temperature of 50° to 60°C. to reduce the nucleic acid content of the protein.

3,960,660

METHOD OF PRODUCING GUANOSINE BY FERMENTATION

Hitoshi Enei, Zushi; Katsuaki Sato, Kawasaki, and Yoshio Hirose, Fujisawa, all of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed Mar. 27, 1975, Ser. No. 562,402
Claims priority, application Japan, Mar. 30, 1974, 49-36371
Int. Cl.[2] C12D 13/06
U.S. Cl. 195—28 N 4 Claims

1. A method for producing guanosine, which comprises culturing a guanosine-producing mutant of the genus Bacillus, which requires adenine for growth and is resistant to 1,000γ/ml of psicofuramine or 500γ/ml of decoyinine under aerobic conditions in an aqueous culture medium until guanosine accumulates in the medium, and recovering accumulated guanosine from culture medium.

3,960,661
METHOD FOR PRODUCING INOSINE BY FERMENTATION

Hitoshi Enei, Zushi; Katsuaki Sato, Kawasaki; Morikatsu Ishii, Chigasaki, and Yoshio Hirose, Fujisawa, all of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed Mar. 27, 1975, Ser. No. 562,401
Claims priority, application Japan, Mar. 30, 1974, 49-36370
Int. Cl.² C12D *13/06*
U.S. Cl. 195—28 N 7 Claims

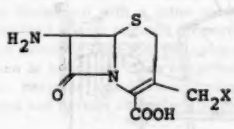
1. A method for producing inosine, which comprises culturing an inosine-producing mutant of the genus Bacillus, which requires adenine for growth and which is more resistant to at least one sulfa drug than the parent strain from which it is derived and has a resistance at a concentration of 100γ/ml to sulfaguanidine, sulfadiazine or sulfathiazole, under aerobic conditions in an aqueous culture medium until inosine accumulates in the medium, and recovering accumulated inosine from culture medium.

3,960,662
PROCESS FOR THE PRODUCTION OF 7-AMINO-CEPHEM COMPOUNDS

Tetsuo Matsuda; Tsutomu Yamaguchi, both of Tagata; Tadashiro Fujii; Kunio Matsumoto, both of Mishima; Masataka Morishita, Tagata; Mitsuru Fukushima, Shizuoka, and Yuzo Shibuya, Tagata, all of Japan, assignors to Toyo Jozo Kabushiki Kaisha, Japan

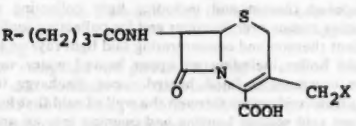
Filed Jan. 23, 1975, Ser. No. 543,639
Claims priority, application Japan, Jan. 23, 1974, 49-10471
Int. Cl.² C12D *13/06*
U.S. Cl. 195—29 1 Claim

1. A process for the production of 7-amino-cephem compounds of the formula



[I]

wherein X represents hydrogen, hydroxy, acetoxy or a nucelophilic residual group, which comprises contacting a 7-acylamino-cephem compound of the formula



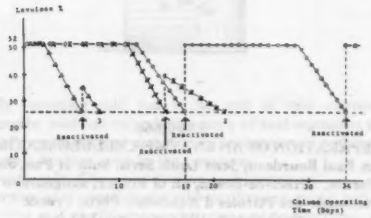
[II]

wherein R represents —COOH or —COCOOH and X has the same meaning as above with a microbial culture or preparation thereof containing deacylating enzyme derived from *Comamonas sp.* NRRL B-8070 in an aqueous medium.

3,960,663
PROCESS FOR THE CONTINUOUS ISOMERIZATION OF DEXTROSE

Masaki Tamura, Machida; Soichiro Ushiro, Kokubunji, and Shiro Hasagawa, Tama, all of Japan, assignors to CPC International Inc., Englewood Cliffs, N.J.

Filed Sept. 13, 1974, Ser. No. 505,823
Claims priority, application Japan, Sept. 13, 1973, 48-102748
Int. Cl.² C12D *13/00*
U.S. Cl. 195—31 F 6 Claims



1. A process for the continuous isomerization of dextrose to levulose comprising:

passing a solution containing dextrose, at a pH of from about 7.0 to about 8.5, through a bed of immobilized dextrose isomerase prepared by bringing a solution of dextrose isomerase into contact with a porous or macroreticulated strongly basic anion exchange resin having $-N-(CH_3)_3-X$ as the ion exchange group;

removing a levulose-bearing solution from the bed until a decrease in enzyme activity occurs, then passing additional dextrose isomerase through the bed to reactivate said bed,

continuing to pass the solution containing dextrose through the reactivated bed, and

recovering additional levulose-bearing solution therefrom.

3,960,664
BACTERIAL PRODUCT USEFUL FOR MAKING SAUSAGE

Ronald H. Olsen, Ann Arbor, and Harold Rothchild, Kalamazoo, both of Mich., assignors to Microlife Technics, Inc., Sarasota, Fla.

Continuation of Ser. No. 870,992, Oct. 6, 1969, abandoned, which is a division of Ser. No. 620,643, March 6, 1967, Pat. No. 3,561,977. This application July 10, 1975, Ser. No. 594,797
Int. Cl.² C12K *1/08*
U.S. Cl. 195—59 4 Claims

1. A bacterial product useful for fermenting comminuted meat containing sausage making ingredients consisting essentially of a substantially neutralized concentrate of live cells of *Pediococcus cerevisiae*, said concentrate being stabilized against rapid loss of viability by being in admixture with a freezing stabilizing agent and a nutrient medium, the concentrate being frozen so that it can be stored for a long time without major loss in the viability of the bacteria, the concentrate containing at least about 10^9 cells per ml and wherein the growth of *Pediococcus cerevisiae* when the concentrate is admixed with comminuted meat containing sausage making ingredients inhibits the growth of indigenous bacteria in the meat.

3,960,665

PRODUCTION OF PROTEOLYTIC ENZYMES

Karl Johan Stampe Villadsen, Brabrand, and Karin Pinholt Vestberg, Arhus, both of Denmark, assignors to Karl Johan Stampe Villadsen, Brabrand, Denmark

Filed July 2, 1973, Ser. No. 376,050

Claims priority, application United Kingdom, July 7, 1972, 31865/72

Int. Cl.² C12D *13/10*

U.S. Cl. 195—66 R 7 Claims

1. Process for the production of proteolytic enzymes by aerobic fermentation of a medium containing cabohydrates, comprising using *Bacillus firmus* var. *arosia*, strain NCIB 10557, for the fermentation, and recovering the produced enzymes from the resulting fermentation liquid.

3,960,666

PREPARATION OF AN ENZYME-CELLULOSE COMPLEX

Jean Paul Bourdeau; Jean Louis Seris, both of Pau, and Rene Pornin, Arthez-de-Bearn, all of France, assignors to Societe Nationale des Petroles d'Aquitaine, Paris, France

Filed Oct. 8, 1974, Ser. No. 513,048

Claims priority, application France, Oct. 12, 1973, 73.36428

Int. Cl.² A23C *19/02*; C07G *7/02*

U.S. Cl. 195—68 5 Claims

1. The method of producing an enzymatic solid composition consisting of cellulose pieces having fixed thereto an enzyme, which comprises: (a) comminuting a cellulose material having 5 to 25 percent by weight of lignin, with respect to dry cellulose, into pieces having dimensions of about 0.2 to about 10 mm; (b) treating the pieces with an alkaline aqueous solution until the surface of the pieces is substantially free of lignin; (c) washing the treated pieces with water; (d) introducing the pieces into an excess of pyridine, adding a chlorinating agent from the group consisting of thionyl chloride, sulfuryl chloride, phosphorus trichloride and phosphorus pentachloride, to the pyridine, and allowing the mixture to stand until a proportion of sulfur of 0 to 6 percent of dry cellulose and a proportion of chlorine of 0 to 3.2 percent of dry cellulose is combined with the cellulose, at least one of the two proportions being more than 0; (e) separating the pieces from the pyridine and the chlorination agent, washing them with water and with an acid, and then introducing them into an aqueous buffer solution having a pH at which the given enzyme is not stable; (f) mixing the buffer solutions with enzyme and stirring the mixture until enzyme is bound to said pieces, and (g) separating the pieces from the solution and washing them.

3,960,667

ANTIBIOTIC A-23187 AND PROCESS FOR PREPARATION THEREOF

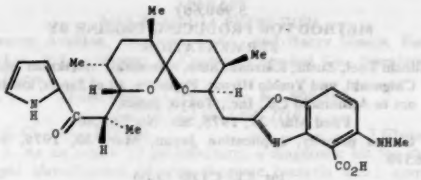
Richard M. Gale; Calvin E. Higgens, and Marvin M. Hoehn, all of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 237,532, March 23, 1972, abandoned, Division of Ser. No. 434,312, Jan. 17, 1974. This application July 8, 1975, Ser. No. 594,157

Int. Cl.² C12D *9/00*

U.S. Cl. 195—80 R 2 Claims

1. The method for producing the antibiotic A-23187 of the formula



which comprises cultivating Streptomyces chartreusis NRRL 3882 in a culture medium containing assimilable sources of carbon, nitrogen and inorganic salts under submerged aerobic fermentation conditions until a substantial amount of antibiotic A-23187 is produced by said organism in said culture medium.

3,960,668

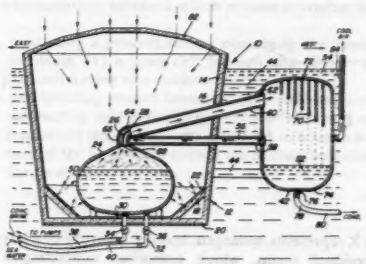
SOLAR POWERED SEA WATER EVAPORATING AND CONDENSING UNIT

Martin A. Rush, 2501 Cincinnati-Dayton Road, Middletown, Ohio 45042

Filed July 3, 1974, Ser. No. 485,577

Int. Cl.² B01D *3/00*

U.S. Cl. 202—185 R 8 Claims



1. A solar still including side-by-side first and second hollow housings, rigid connecting means extending between and interconnecting said housings, said first housing having a boiler disposed therein and including light collecting and concentrating means over its upper end for collecting sunlight rays incident thereon and concentrating said light rays on said boiler, said boiler including an upper heated water vapor outlet, an upwardly inclined heated vapor discharge tube extending from said outlet through the wall of said first housing adjacent said second housing and opening into an upper portion of said second housing, heat conducting baffle means supported within the upper portion of said second housing in good heat transfer relation with said second housing, said second housing including cooled air outlet means opening outwardly of said second housing below the discharge end of said discharge tube and discharging to atmosphere via a vent tube, a cool air inlet pipe for said first housing passing through its wall and opening into said discharge tube adjacent the

lower end thereof, said still having a total weight somewhat less than the total volume of water displaceable thereby whereby said still may be floated in a body of salt water, the elevation of said second housing relative to said first housing being such that said second housing is at least substantjally fully submerged when said still is floating, thereby enabling the ambient water to shield the second housing against direct rays of the sun incident thereon, said still being positionable with the first housing disposed to the east and the second housing disposed to the west, whereby the still may tilt from east to west, during vaporization of a batch of water from said boiler and its condensation in said second housing, to thereby increase the efficiency of the light collecting and concentrating means.

3,960,669

URINE DIAGNOSTIC TEST FOR FIBRINOLYTIC ACTIVITY

Irving Innerfield, Tenafly, N.J., assignor to Association for Pharmacologic Research, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 323,603, Jan. 15, 1973, abandoned. This application Feb. 11, 1975, Ser. No. 549,113

The portion of the term of this patent subsequent to Dec. 10, 1991, has been disclaimed.

Int. Cl.² G01N *31/14*

U.S. Cl. 195—103.5 R **6 Claims**

1. A method of detecting an abnormal concentration of fibrinolytic enzymes and fibrinogen degradation products in the blood of an individual, such an abnormal concentration being characteristic of certain pathologic states, comprising the steps of determining the average and the range of clotting times of standardized saline solutions of buffered thrombin, fibrinogen and urine from healthy subjects combined in selected proportions at a selected temperature, and determining the individual clotting time at the same selected temperature of the same standardized saline solutions of buffered thrombin and fibrinogen with a urine specimen from said individual combined in said selected proportions, an individual clotting time deviating by a selected amount from said average being taken as indicative of an abnormal concentration of fibrinolytic enzymes and fibrinogen degradation products in the blood and certain characteristic pathologic states.

3,960,670

METHOD AND APPARATUS FOR STERILITY MONITORING

Irving J. Pflug, 10 E. Oaks, St. Paul, Minn. 55110

Filed Sept. 2, 1975, Ser. No. 609,700

Int. Cl.² C12K *1/04*

U.S. Cl. 195—103.5 R **10 Claims**

1. Apparatus for monitoring the effectiveness of a sterilization cycle on the contents of a container, said apparatus comprising:

an elongated rod portion adapted to extend interiorly of said container into the contents thereof;

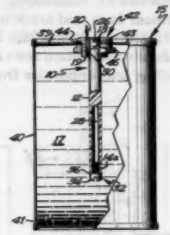
said rod including an internal reservoir portion adapted to receive a sterilization sensitive agent;

closure means for hermetically sealing said reservoir portion thereby isolating said heatsensitive agent from said container contents; and

attachment means for rigidly fastening said apparatus to said container, said attachment means adapted to maintain said container in a sealed condition, and operable to positively maintain said rod in a predetermined position within said container.

6. A method for quantitatively measuring the effectiveness of a sterilization cycle on the contents of a container, said method comprising the steps of:

hermetically sealing a predetermined quantity of a sterilization sensitive agent within a reservoir provided in a rod;



rigidly fastening said rod to an end of said container whereby said rod extends interiorly of said container and rigidly positions and maintaining said reservoir within the slowest heating zone in the container;

conventionally filling and sealing said container;

subjecting said container to said sterilization cycle; and

analyzing said sterilization sensitive agent to determine the effects of the sterilization process thereon.

3,960,671

QUINONES AS CORROSION INHIBITOR IN DISTILLING ALKANOIC ACIDS

James S. Clovis, Morrisville, and Jerome Dohling, Huntingdon Valley, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed June 17, 1974, Ser. No. 480,063

Int. Cl.² C23F *14/02*

U.S. Cl. 203—7 **21 Claims**

1. In the process for distilling corrosive lower chain alkanoic acids in corrodible metallic distillation apparatus the steps of introducing a crude dilute solution of said corrosive acid into the distillation zone, distilling said acid in the presence of an amount of p-benzoquinone or 1,4-naphthoquinone effective to prevent or reduce to an acceptable limit the corrosion of said metallic distillation apparatus by said corrosive acid, and recovering the purified corrosive acid outside the distillation zone.

3,960,672

CONTINUOUS DISTILLATION PROCESS FOR PURIFYING ALKANOLS

Wilhelm Ester, deceased, late of Herne; by Margarete Ester, nee Berkemann, heir, Herne; by Brigitte Lovis, nee Ester, heir, Munster; by Wolfgang Ester, heir, Herne and Wilhelm Heitmann, Herne, all of Germany, assignors to Veba-Chemie AG, Gelsenkirchen-Buer, Germany

Continuation of Ser. No. 223,345, Feb. 3, 1972, abandoned. This application June 21, 1974, Ser. No. 481,943

Claims priority, application Germany, Feb. 9, 1971, 2106073

Int. Cl.² B01D *3/34*

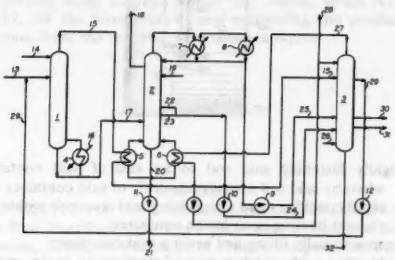
U.S. Cl. 203—37 **8 Claims**

1. In a continuous distillation process for preparing pure C_1–C_3 alkanols from crude water-containing alkanols wherein:

a. crude alkanols containing water and impurities which are lower and higher boiling relative to said alkanols, are introduced to the middle section of an extractive distillation zone and a stream containing said impurities is withdrawn overhead and a dilute aqueous alkanol stream is withdrawn from the bottom of said extractive distillation zone;

b. the dilute alkanol stream from the bottom of said extractive distillation zone is introduced to the lower section of an alkanol distillation zone from which are withdrawn a pure concentrated alkanol stream from an upper section, a stream containing low boiling impurities from a middle section and a stream containing high boiling impurities overhead;

c. the overhead stream from said extractive distillation zone and said streams containing high and low boiling impurities from said alkanol distillation zone are introduced into a zone for distilling said impurities from which are withdrawn a stream containing high boiling impurities from a lower section, a stream containing low boiling impurities overhead and a stream containing alkanols from a middle section, the latter being recycled to said extractive distillation zone with said crude alkanols, the improvement which consists of introducing aqueous alkali hydroxide solution into said alkanol distillation zone at a single point which is above the point from which the stream containing high boiling impurities is withdrawn and below the point from which pure concentrated alkanols are withdrawn.

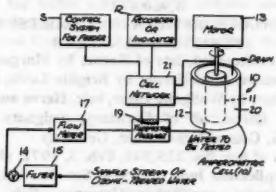


3,960,673

TECHNIQUE FOR CONTINUOUSLY ANALYZING THE CONCENTRATION OF OZONE DISSOLVED IN WATER

James J. Morrow, Norristown, and Leo L. Dailey, Philadelphia, both of Pa., assignors to Fischer & Porter Co., Warminster, Pa.

Continuation-in-part of Ser. No. 44,800, June 9, 1970, abandoned. This application Sept. 27, 1974, Ser. No. 509,829
Int. Cl.² G01N 27/46
U.S. Cl. 204—1 R 5 Claims



1. A technique for continuously analyzing the concentration of ozone in an ozone-treated water supply without the use of chemicals, said technique comprising the steps of:

A. conducting a sample of water from said supply at a predetermined flow rate into the annular space which exists in an amperometric cell formed by a cathode disposed within a tubular anode;

B. rotating said cathode at a speed at which polarization and depolarization actions are uniformly distributed on the cathode surface, said cathode being polarized in the absence of ozone in the sample to produce substantially no current flow in said cell and being directly depolarized by ozone to produce a current flow therein which depends on the concentration of ozone;

C. maintaining a potential on said cathode at a level resulting in a proportional relationship between the concentration of ozone and the resultant current flow; and

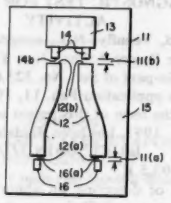
D. measuring said current flow to indicate the concentration of ozone.

3,960,674

METHOD OF DEPOSITING A METAL ON A SURFACE COMPRISING AN ELECTRICALLY NON-CONDUCTIVE FERRITE

Alexander Coucoulas, Bridgewater Township, Somerset County, N.J., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Dec. 20, 1974, Ser. No. 534,920
Int. Cl.² C25D 5/02
U.S. Cl. 204—16 19 Claims



1. A method of depositing a metal on an exposed surface comprising an electrically non-conductive ferrite, having a resistivity of at least 10^4 ohm-cm, which comprises:

directly contacting the exposed ferrite surface with a cathodically charged element, and

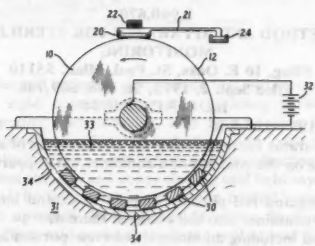
electroplating said element to deposit a metal thereon and on an adjoining portion of said contacted exposed ferrite surface.

3,960,675

METHOD FOR DEPLATING AND REPLATING ROTOGRAVURE CYLINDERS

John C. Motter, York, Pa., assignor to Motter Printing Press Co., York, Pa.

Filed Apr. 17, 1975, Ser. No. 569,003
Int. Cl.² C25D 7/04; C25F 3/00
U.S. Cl. 204—25 9 Claims



1. A method for producing a new printing surface from an intaglio printing surface previously etched for printing use, comprising the steps of:

a. filling the etched wells of said printing surface with an insulative material;

b. deplating metal from said printing surface, while simultaneously scrubbing the insulative material high points even

with the deplating surface, until the deplating surface is reduced below the level of the etched wells, thereby obtaining a smooth metal surface; and

c. replating metal on said smooth surface to the desired thickness.

3,960,676
COATING PROCESS FOR ALUMINUM AND ALUMINUM ALLOY

Yoshiaki Miyosawa, and Sueo Umemoto, both of Hiratsuka, Japan, assignors to Kansai Paint Company, Ltd., Japan

Filed Sept. 24, 1973, Ser. No. 400,171
Claims priority, application Japan, Oct. 4, 1972, 47-98943
Int. Cl.² C25D *5/00, 13/06, 9/02*
U.S. Cl. 204—38 A **8 Claims**

6. The coating process of claim 1 wherein said hydrophilic coating is deposited by applying a direct current of 30–120 volts or an alternating current of 10–40 volts between said article and a counter electrode.

3,960,677
ACID ZINC ELECTROPLATING

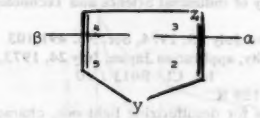
Roelof Hildering, Vianen, Netherlands, and Anton Mudrak, Broadview Heights, Ohio, assignors to The Harshaw Chemical Company, Cleveland, Ohio

Filed Sept. 27, 1974, Ser. No. 510,090
Int. Cl.² C25D *3/22*
U.S. Cl. 204—55 R **7 Claims**

1. A bright acid zinc aqueous electroplating bath containing an inorganic zinc salt, and improved by the inclusion of:

a. between about 5 and about 25 grams per liter of a carboxy terminated alkyl phenol polyglycol ether wetting agent, and

b. between about 0.1 and about 10 g/l of a heterocyclic compound having the following structural formula:



Wherein

y is either S, O, or SO_2,

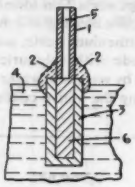
Z is either —C or N when *y* is S, or is —C when *y* is SO_2, or O,

α is a saturated or unsaturated aliphatic chain further substituted by a carbonyl, hydroxy, or cyano group when *z* is —C, or is a mercapto group or hydrazino group when *z* is N, or is H when *y* is SO_2, and is attached to any available carbon atom on the heterocyclic nucleus at the 2 or 3 position, provided, however, that when α is hydrogen or an aliphatic chain attached at the 2 position, the compound also includes a hydrogen atom attached to —C at the 3 position, and β is H or a halogen selected from the group consisting of Cl and Br, and is attached to any available carbon atom in the heterocyclic nucleus, or is a phenylene group attached to the heterocyclic ring at the 4 and 5 positions.

3,960,678
ELECTROLYSIS OF A MOLTEN CHARGE USING INCOMSUMABLE ELECTRODES

Hanspeter Alder, Flurlingen, Switzerland, assignor to Swiss Aluminium Ltd., Chippis, Switzerland

Filed May 15, 1974, Ser. No. 470,198
Claims priority, application Switzerland, May 25, 1973, 7522/73
Int. Cl.² C25C *3/06, 3/12;* **C05B** *35/00*
U.S. Cl. 204—67 **10 Claims**



1. In a process for operating a cell for the electrolysis of a molten charge containing aluminum oxide, the cell being of the type including at least one anode,

the steps comprising:

using a non-consumable anode having a working surface of ceramic oxide material to be at least partially in contact with the molten charge, and

maintaining a current density above a predetermined minimum value over that part of the anode surface in contact with the molten charge.

7. In a process as claimed in claim 1, and providing the anode, at least in the three phase interface region where the atmosphere and the molten charge surface are in contact, with a protective layer of an electrically insulating material resistant to attack by the molten charge.

3,960,679
PROCESS FOR HYDRODIMERIZING OLEFINIC COMPOUNDS

Charles R. Campbell; Donald E. Danly, both of Pensacola, Fla., and Werner H. Mueller, Kelkheim Hornau, Taunus, Germany, assignors to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 497,807, Aug. 15, 1974, abandoned, which is a continuation-in-part of Ser. No. 284,373, Aug. 28, 1972, Pat. No. 3,830,712. This application June 27, 1975, Ser. No. 591,181
Int. Cl.² C25B *3/10;* **C07C** *121/26, 103/147, 69/34*
U.S. Cl. 204—73 A **15 Claims**

1. A process for hydrodimerizing an olefinic compound having the formula $R_2C{=}CR{-}X$ wherein —X is —CN, —$CONR_2$ or —COOR′, R is hydrogen or R′, R′ is C_1–C_4 alkyl and at least one R directly attached to either of the two carbon atoms joined by the double bond in said formula is hydrogen which comprises electrolyzing an aqueous solution having dissolved therein at least about 0.5% but less than about 5% by weight of said olefinic compound, at least about 1% by weight of sodium or potassium salt selected from the group consisting of phosphate, borate, perchlorate, carbonate and sulfate sufficient to provide sodium or potassium ions constituting more than half of the total weight of all cations in the solution and from about 10^{-5} to about 0.5 gram mol per liter of C_{17}–C_{36} polymethylenebis(trialkylammonium) ions in which each trialkylammonium radical contains at least two C_3–C_6 alkyl groups and the polymethylene radical is C_3–C_9 in contact with a cathodic surface having a cathode potential sufficient for hydrodimerization of said olefinic compound and consisting essentially of cadmium with a current density between about 0.01 and about 1.5 amps per square centimeter of said cathodic surface and at a temperature between about 5° and about 75°C.

3,960,680

TREATMENT OF CATALYTIC ANODES

Nicholas William James Pumphrey, and William Laurence Woods, both of Runcorn, England, assignors to Imperial Chemical Industries Limited, Millbank, England

Filed Apr. 18, 1974, Ser. No. 462,116

Claims priority, application United Kingdom, Apr. 25, 1973, 19574/73

Int. Cl.² B01D 3/00

U.S. Cl. 204—98 11 Claims

1. A process for removing a barium containing scale from an anode which comprises a film-forming metal carrying an electrocatalytically active coating of a mixture of (1) an oxide of titanium and (2) ruthenium oxide, said process comprising treating the said anode with sulphuric acid containing not more than 10 percent by weight of water thereby removing the scale without removing the active coating.

3,960,681

METHOD FOR PRODUCING ELECTROLYTIC HIGH PURITY LEAD USING LARGE-SIZED ELECTRODES

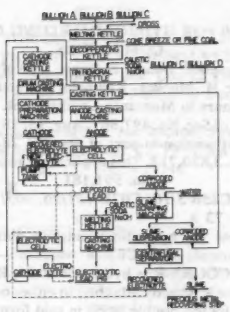
Etsuji Nomura, Tokyo; Masaharu Aramaki, Takehara, and Yuji Nishimura, Omuta, all of Japan, assignors to Mitsui Mining & Smelting Co., Ltd., Tokyo, Japan

Filed Jan. 29, 1975, Ser. No. 545,125

Claims priority, application Japan, Feb. 21, 1974, 49-20838; Feb. 22, 1974, 49-21164

Int. Cl.² C25C 1/18; C25B 11/04

U.S. Cl. 204—114 5 Claims



1. In a method for the electrolytical production of lead according to the Betts process, the improvement comprising using anodes of crude lead, containing as impurities 0.8 to 1.3% by weight of antimony, 0.6% by weight or less of bismuth, 0.1% by weight or less of copper, 0.05% by weight or less of tin, and arsenic, the ratio of the sum of the contents of antimony and arsenic to the content of bismuth being 2.0 or more, whereby there is produced electrolytically deposited lead which is feasible for being refined into a purity of 99.999% or more in the Harris process.

3,960,682

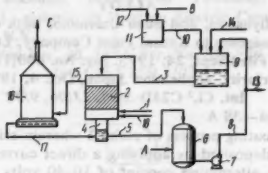
METHOD OF PROCESSING WASTE GASES CONTAINING SULPHUROUS-ACID ANHYDRIDE

Rimma Bronislavovna Baranova; Vladimir Ilich Lazarev; Nikolai Petrovich Mironov; Viktor Alexandrovich Pinaev; Lenar Timofeevich Bugaenko; Evgeny Petrovich Kalyazin; Alexandra Timofeevna Panferova; Vsevolod Mikhailovich Byakov; Jury Nikolaevich Nikeshichev, all of Moscow, and Petrovich Evgeny Petryaev, Minsk, all of U.S.S.R., assignors to Jury Nikolaevick Nikeshichev and Evgeny Petrovich Petryoev, 2, U.S.S.R.

Filed Sept. 6, 1974, Ser. No. 503,952

Int. Cl.² B01J 1/10

U.S. Cl. 204—157.1 H 13 Claims



1. A method of processing waste gases containing sulphurous-acid anhydride comprising the steps of contacting said waste gases with an aqueous solution of sulphuric acid in the presence of a gas selected from the group consisting of oxygen and air and a catalyst selected from the group of inorganic manganese salts consisting of manganese sulphate, manganese perchlorate, manganese chloride, manganese nitrate and manganese phosphate used in an amount of 0.0003–0.03 wt.% based on manganese ion to obtain an aqueous solution of sulphuric acid containing sulphurous-acid anhydride, subjecting the resulting solution to the action of ionizing radiation for initiating the oxidation of sulphurous-acid anhydride to obtain an aqueous solution of sulphuric acid substantially free of sulphurous-acid anhydride, removing a part of the sulphuric acid in the form of the resulting solution in an amount equivalent to the amount of the oxidized sulphurous-acid anhydride, and feeding the remaining part of the aqueous solution of sulphuric acid for contacting with said waste gases.

3,960,683

PROCESS FOR THE DESULFURIZATION OF LIGHT OILS

Yoshio Baba, Kawaguchi, Japan, assignor to Director-General of the Agency of Industrial Science and Technology, Tokyo, Japan

Filed July 23, 1974, Ser. No. 491,103

Claims priority, application Japan, July 24, 1973, 48-83318

Int. Cl.² B01J 1/10

U.S. Cl. 204—158 R 4 Claims

1. A process for desulfurizing light oils, characterized by irradiating a light oil containing sulfur compounds such as mercaptans and sulfides with ultraviolet rays in the presence of oxygen to decompose said sulfur compounds into water-soluble compounds and thereafter, washing said light oil with water to remove said water-soluble compounds.

3,960,684

SULFONES AS SOLVENTS IN CATALYSTS OF U.V. CURABLE SYSTEMS

Jacob Howard Feinberg, Hightstown, N.J., assignor to American Can Company, Greenwich, Conn.

Division of Ser. No. 355,882, April 30, 1973, abandoned. This application Sept. 30, 1974, Ser. No. 510,176

Int. Cl.² B01J 1/10; C08G 51/46

U.S. Cl. 204—159.11 13 Claims

1. A polymerizable composition, capable of being shipped and stored as a two-package system, consisting essentially of

(1) a monomeric or prepolymeric epoxide material or mixture thereof with a monomer selected from the group consisting of lactones and vinyl-containing compounds, said material being polymerizable to higher molecular weights through the action of a cationic catalyst and (2) a radiation-sensitive aromatic diazonium salt of a complex halogenide, which decomposes upon application of energy to release a Lewis Acid effective to initiate polymerization of said epoxide material, dissolved in an organic sulfone, said organic sulfone being substantially inert to said diazonium salt and to said epoxide material.

3,960,685

PHOTOSENSITIVE RESIN COMPOSITION CONTAINING PULLULAN OR ESTERS THEREOF

Takezo Sano, Takatsuki; Yukikazu Uemura, Amagasaki, and Akihiro Furuta, Takatsuki, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka and Hayashibara Biochemical Laboratories, Incorporated, Okayama, both of, Japan

Filed Nov. 5, 1974, Ser. No. 521,151

Claims priority, application Japan, Nov. 12, 1973, 48-127505; Nov. 12, 1973, 48-127506

Int. Cl.² C08L *1/00, 3/00*

U.S. Cl. 204—159.12 **21 Claims**

1. A photosensitive resin composition comprising

30 to 90 parts by weight of at least one member selected from the group consisting of pullulan, an acetylation product of pullulan, an ester of pullulan with an unsaturated organic acid and a cinnamoylated ester of pullulan,

70 to 10 parts by weight of a photopolymerizable monomer,

0.5 to 5 parts by weight of a photosensitizer and

0.1 to 1 part by weight of a thermal polymerization inhibitor per 100 parts by weight of said polymerizable monomer.

3,960,686

METHOD FOR PREPARING LOW PILLING EFFECT POLYESTER FIBER PRODUCTS

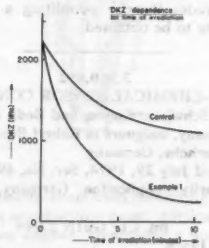
Karl Heinz Magosch; Roland Feinauer, and Jorn Ruter, all of Marl, Germany, assignors to Chemische Werke Huls Aktiengesellschaft, Marl, Germany

Filed Dec. 27, 1974, Ser. No. 536,987

Claims priority, application Germany, Jan. 4, 1974, 2400317

Int. Cl.² C08G *18/00*

U.S. Cl. 204—159.19 **8 Claims**



1. An improvement in the process of melt spinning ethylene terephthalate polyester to produce textile fibers having substantially decreased pilling in fabrics containing the fibers comprising melt polymerizing ethylene terephthalate in the presence of a condensation catalyst to a final temperature of about 250° to 300°C and a final pressure of less than 10 mm of mercury to form an anhydrous melt, the improvement comprising:

conducting said melt polymerizing in the presence of about 0.05 to 5.0 mole percent of a substituted cyclobutanedimethanol;

melt spinning said anhydrous melt; and

exposing said melt spun fibers to irradiation with high energy light.

3,960,687

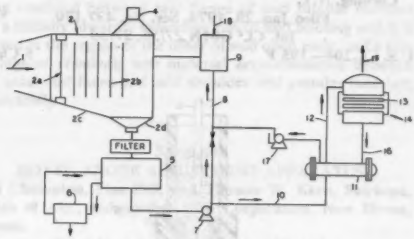
ELECTROSTATICALLY ENHANCED REMOVAL OF SULFUR DIOXIDE FROM GASEOUS CARRIERS

Even Bakke, New Providence; Michael Witte, Chatham, and Manankumar S. Mehta, Parsippany, all of N.J., assignors to U.S. Filter Corporation, New York, N.Y.

Filed Oct. 29, 1973, Ser. No. 410,447

Int. Cl.² C01B *17/60*; B01K *1/00*

U.S. Cl. 204—164 **4 Claims**



1. In the removal of sulfur dioxide values from a sulfur dioxide bearing industrial waste gas stream,

the steps of

passing a water vapor saturated sulfur dioxide bearing gas stream through a charging zone to apply electrical charge to at least some of the constituent components thereof,

introducing said charged sulfur dioxide bearing gas stream into absorbent contact with a concentrated solution of monoammonium phosphate and diammonium phosphate in a deposition zone wherein the weight basis proportion of mono to diammonium phosphate in said solution is in the range of about 4 to 1 to about 10 to 1 to effect removal of sulfur dioxide values from said gas stream,

and maintaining an electrostatic force field between said charging zone and said deposition zone to electrostatically induce the directed displacement of the charged constituent components of said gas stream into absorbent contact with said solution.

3,960,688

PROCESS FOR ELECTRODEPOSITING COATINGS ON METAL

Leonard Joseph Calbo, Jr., Ardsley, N.Y., assignor to American Cyanamid Company, Stamford, Conn.

Filed Oct. 4, 1974, Ser. No. 512,282

Int. Cl.² C25D *13/06*

U.S. Cl. 204—181 **10 Claims**

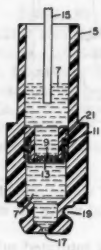
1. A process for electrodepositing films on electroconductive metal comprising immersing said metal in an aqueous dispersion of a mixture of from about 5% to about 40%, by weight, of (A) a substantially water-insoluble, substantially fully etherified, substantially fully methylolated melamine; a substantially water-insoluble, substantially fully etherified, substantially fully methylolated guanamine or a substantially water-insoluble, substantially fully butylated urea-formaldehyde reaction product and correspondingly from about 95% to about 60%, by weight, of (B) a water dispersible non-gelled polymeric material carrying an ionic charge which polymeric material contains at least one class of reactive groups selected from the group consisting of carboxyl groups, alcoholic hydroxy groups, amine groups and amide groups, wherein the amount of said groups is at least 3%, by weight, and not more than about 30%, by weight, based on the total weight of said polymeric material; wherein said groups are heat reactive with

(A); and as a curing catalyst for (A) and (B) from about 0.2% to about 10%, by weight, of (C) an aromatic sulfonic acid compound having an equivalent weight of at least 250 and subjecting the aqueous dispersion to electrophoresis in order to deposit the catalyzed mixture of (A) and (B) on the metal as an adherent film; wherein the percentages of (A) and (B), by weight, total 100% and are based on the total solids weight of (A) and (B) and the percentage weight of (C) is also based on the total solids weight of (A) and (B).

3,960,689
pH REFERENCE ELECTRODE

Terry O. Lanier, Northboro, and Nunna Ramanaiah, Framingham, both of Mass., assignors to Corning Glass Works, Corning, N.Y.

Filed Jan. 28, 1974, Ser. No. 437,170
Int. Cl.² G01N 27/56, 27/30
U.S. Cl. 204—195 F 5 Claims

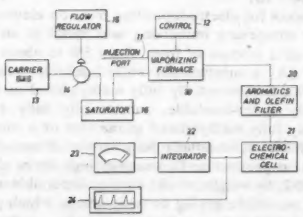


1. In a pH reference electrode comprising an electrode housing containing a concentrated KCl solution, an internal reference electrode in electrical contact with the solution, and means in the electrode housing defining a passageway for electrochemical contact between the solution and a fluid, the pH of which is to be determined, the improvement which comprises providing KCl crystals in the solution, the crystals being held in place by an inert foraminous material disposed intermediate the internal reference electrode and the passageway and the foraminous material being a screen having orifaces smaller than the passageway.

3,960,690
ELECTROCHEMICAL DETECTOR FOR LEAD ALKYLS

Donald C. Olson, Florissant, Mo., assignor to Shell Oil Company, Houston, Tex.

Filed Aug. 29, 1974, Ser. No. 501,513
Int. Cl.² G01N 27/46
U.S. Cl. 204—195 R 7 Claims

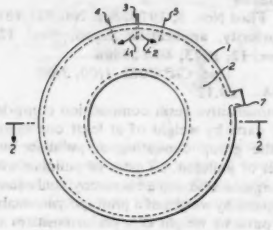


1. An apparatus for measuring trace amounts of lead alkyls in gasoline comprising:
- a vaporizer including means for supplying a sample of the gasoline containing the trace alkyls thereto;
- a filter, said filter being in communication with said vaporizer and designed to separate the aromatic and olefin components from the lead alkyls in the vaporized sample;
- an electrochemical cell having spaced counter and indicator electrodes separated by a liquid electrolyte containing a metal salt, said filter being in communication with said electrochemical cell; and
- means for measuring the current produced by said cell when the vaporized sample is introduced therein.

3,960,691
TACTICAL RATE SENSOR

Bart J. Zoltan, Emerson, and John L. Evans, Oakland, both of N.J., assignors to The Singer Company, Little Falls, N.J.

Filed Jan. 31, 1975, Ser. No. 545,995
Int. Cl.² G01N 27/46; G01P 15/00, 15/08
U.S. Cl. 204—195 R 6 Claims



1. A rotational rate sensor for a vehicle capable of rotation about at least one axis comprising:
- a. a closed container affixed to the vehicle where rotational rate is to be measured;
- b. a low viscosity electrolytic fluid filling said container;
- c. a set of three electrodes comprising two output electrodes and a central electrode placed between said output electrodes inserted through the wall of said container and extending into said electrolytic fluid, said electrodes lying in a plane perpendicular to the axis about which rotational rate is to be measured;
- d. means for applying a voltage to said electrodes to establish an electron current flow therebetween coupled to said electrodes outside said container; and
- e. means for measuring the rate of electron flow between said electrodes thereby permitting a measurement of angular rate to be obtained.

3,960,692
ELECTRO-CHEMICAL SENSOR CONSTRUCTION

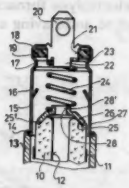
Helmut Weyl, Schwieberdingen, and Bodo Ziegler, Stuttgart, both of Germany, assignors to Robert Bosch G.m.b.H., Gerlingen-Schillerhohe, Germany

Filed July 29, 1974, Ser. No. 492,520
Claims priority, application Germany, Oct. 6, 1973, 2350252
Int. Cl.² G01N 27/46
U.S. Cl. 204—195 S 14 Claims

1. Electro-chemical sensor construction having a tubular housing (13) with an opening therein (30);
- an ion conductive solid electrolyte tubular body (10, 110), closed at one end, and seated in the housing;
- an outer electrical conductor (11) located on the outer surface of the tubular body;
- an inner electrical conductor (12) located on the inner surface of the tubular body;
- a terminal (20) insulatingly secured to the housing (13, 15);
- an insulating disk (19) mechanically secured across the tubular housing (13, 15), the terminal (20) being attached to said disk and having a portion passing there-

through and facing the open end of the electrolyte body (19, 110);

and a stressed helical compression spring (24) of electrically conductive material under compressive force extending axially within the housing, compressed between the tubular body (10, 110) and the terminal (20) forming at least a portion of the sole electrical connection between the terminal (20) and the inner conductor (12), as well as a mechanically reliable, yet resilient connection between the terminal and the tubular body (10, 110) on which the conductor (12) is located, the compressive force of the compression spring (24) being transferred to the housing (13, 15) by the tubular body (10, 110) and by the terminal (20) and the insulating disk (19).



3,960,693

DEVICE FOR ELECTROCHEMICALLY MEASURING THE CONCENTRATION OF OXYGEN IN COMBUSTION GASES

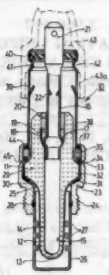
Helmut Weyl, Schwieberdingen, and Leo Steinke, Hegnach, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Mar. 1, 1974, Ser. No. 447,330

Claims priority, application Germany, Mar. 28, 1973, 2315444

Int. Cl.² G01N 27/46

U.S. Cl. 204—195 S **16 Claims**



1. A device for electro-chemically measuring the concentration of oxygen in combustion gases, particularly those of internal combustion engines, comprising a housing having a passage which is formed with two spaced open ends with an inner circumferential shoulder intermediate said ends; a tubular member of ion-conducting solid electrolyte material having a closed-ended first portion which projects from one of said open ends, and a second portion which extends through said passage and is formed with an outer circumferential flange one axial end face of which faces towards said one open end and is supported by said shoulder and another axial end face of which faces away from said one open end, the interior of said tubular member being in communication with the ambient atmosphere and the exterior of said first portion being adapted for exposure to a flow of combustion gases, and the materials of said housing and said tubular member having differential coefficients of thermal expansion and contraction; an electron-conductive inner electrode on an inner surface of said tubular member and being conductively connected with an outside terminal portion; an electron-conductive outer electrode on an outer surface of said tubular member and being conductively connected with said housing; and compensating means in said housing fixed with reference thereto and engaging said second portion of said tubular member, said compensating means being operative to compensate for said differential coefficients so as to prevent development of cracks or loosening of the seal between said housing and tubular member, said compensating means being an annular member surrounding said second portion and being of a material having a coefficient of thermal expansion and contraction which compensates for said difference, said annular member being confined between said flange of said tubular member and a radially inwardly extending rim of said housing which is located in the region of the other of said open ends; and a pair of rings of relatively soft material accommodated between said axial end faces and said shoulder and annular member, respectively.

3,960,694

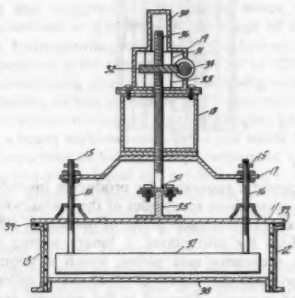
NOVEL ANODE ADJUSTMENT APPARATUS

Fred Champion, Pine Hill, and Thomas W. Kern, Fairhope, both of Ala., assignors to Olin Corporation, New Haven, Conn.

Filed Nov. 8, 1974, Ser. No. 522,403

Int. Cl.² C01D 1/14

U.S. Cl. 204—219 **6 Claims**



1. In a mercury cell comprised of a cell body, a cell cover, anodes positioned within said cell body having anode posts extending through openings in said cell cover, and an anode adjustment means positioned on the top of said cell cover to adjust the distance between said anodes and said mercury, the improvement which comprises employing as said anode adjustment means an apparatus comprised of:

a. a central base member positioned on top of said cell cover substantially parallel to the sides of said cell body,

b. at least two threaded upright posts having the bottom of each secured at spaced intervals to the top of said central base member,

c. a worm gear adjuster secured to the top of each of said threaded posts, said worm gear adjuster being comprised of:

1. a worm gear housing secured to a central anode support member positioned above said central base member and spaced apart therefrom,

2. a worm gear having a threaded central opening adapted to rotate about the top of said threaded post,

3. a threaded worm adapted to mesh with threads on the circumference of said worm gear, said worm being positioned substantially parallel to said central anode support member,

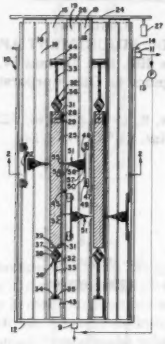
4. a rod secured to and joining each of said worms,
5. a plurality of anode support arms secured at spaced intervals along said central anode support member,
6. a plurality of anodes secured to opposite sides of each of said anode arms, and
7. means for rotating said rod, whereby said worms are rotated, said worm gears are rotated, and said central anode support member, said anode arms and all of said anodes secured to said arms are raised or lowered in the direction of movement of said worm gear on said threaded posts.

3,960,695

APPARATUS FOR THE ELECTROLYTIC PRODUCTION OF INSOLUBLE METAL HYDROXIDE

Paul S. Roller, 1440 N St., NW., Apt. 208, Washington, D.C. 20005

Filed Feb. 22, 1974, Ser. No. 444,790
Int. Cl.² C25D 17/00
U.S. Cl. 204—227 **14 Claims**



1. An electrolytic apparatus for producing insoluble metal hydroxide in water from electrodes of the metal, which comprises a plurality of electrode plates of the metal; electrolytic current lead-ins for said plates; a binary wiping structure intermediate successive said plates, which is comprised of similar components, the wipers of which are at different wiping levels and reversely directed to the opposite surfaces of successive said plates; reciprocating wiper drive members intermediate successive said plates; as to each said component, connected to said wiper drive members a wiper backing adjacent a plate surface; a plurality of bilateral springs along said backing and connected thereto at both spring ends; and connected to said plurality of bilateral springs a wiper, which is urged by said springs against a plate surface opposite that to which said backing is adjacent.

3,960,696

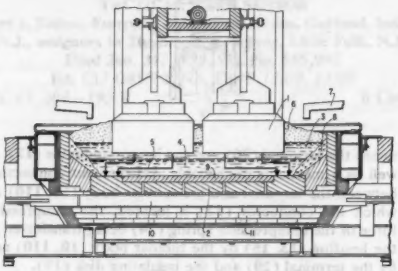
ALUMINUM ELECTROLYSIS FURNACE

Hubert Wittner, Ludwigshafen (Rhine), Germany, assignor to Gebr. Giulini GmbH, Ludwigshafen (Rhine), Germany

Filed June 18, 1974, Ser. No. 480,926
Int. Cl.² C25C 3/08, 7/00
U.S. Cl. 204—245 **8 Claims**

1. In an aluminum electrolysis furnace arranged to be filled with a mass of electrolyte and having a plurality of anodes each presenting a surface through which current flows and a cathode presenting a surface through which current flows, which faces the anode surfaces, and which is located to underlie the region to be occupied by the electrolyte, with at least part of the cathode surface being coextensive with the anode surfaces, the cathode being composed of a plurality of carbon blocks all having the same electrical conductance, the improvement comprising a layer of an electrically nonconductive material covering a portion of the surface of said cathode which faces said anode surfaces, said layer being located to underlie the region to be occupied by the electrolyte and being at least partially coextensive with said anode surfaces and being disposed for creating a current distribution between said anode and cathode which promotes formation of a hardened electrolyte layer at the sides of said furnace.

8. In an aluminum electrolysis furnace arranged to be filled with a mass of electrolyte and having a plurality of anodes, a



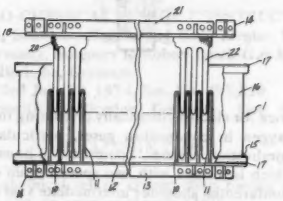
cathode composed of a plurality of carbon blocks all having the same electrical conductance, and means for introducing charges of aluminum oxide at a selected location of the furnace, the improvement comprising means for causing electric current flowing between said cathode and anodes to present a higher current density at such location than at a second location spaced from such location, said means comprising a layer of an electrically nonconductive material covering a portion of the surface of said cathode which faces said anodes in the region of such second location and which underlies the region to be occupied by the mass of electrolyte.

3,960,697

DIAPHRAGM CELL HAVING UNIFORM AND MINIMUM SPACING BETWEEN THE ANODES AND CATHODES

Morton S. Kircher, Oakville, Canada, and Maynard F. Engler, Cleveland, Tenn., assignors to Olin Corporation, New Haven, Conn.

Filed Feb. 4, 1975, Ser. No. 547,062
Int. Cl.² C25B 1/10, 1/26, 9/00
U.S. Cl. 204—252 **18 Claims**



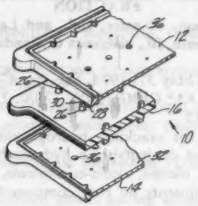
1. A diaphragm cell comprising a cell body, a cathode plate having a plurality of cathodes attached, a diaphragm deposited on said cathodes, an anode plate having a plurality of foraminous metal anodes attached, said cathode plate and said anode plate being sealingly attached to said cell body, and a continuous net interposed between and contacting said anodes and said diaphragm, said net spacing apart said anodes from said diaphragm by a uniform distance.

3,960,698

ELECTRODE SUPPORT FOR FILTER PRESS CELLS

John J. Bortak, Plymouth, Mich., assignor to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Dec. 23, 1974, Ser. No. 535,939
Int. Cl.² B01K 1/00; C25B 9/02
U.S. Cl. 204—267 3 Claims



1. In an electrolytic filter press cell of the type having a central barrier between the electrodes of adjacent cells, the improvement which comprises:

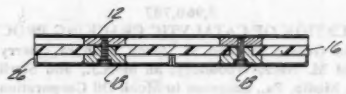
means for supporting the electrodes formed on the central barrier wherein said means for supporting the electrodes comprises a plurality of solid projections formed on the central barrier and wherein the projections abut and engage the electrodes on a first surface thereof.

3,960,699

SELF SUPPORTING ELECTRODES FOR CHLOR-ALKALI CELL

John J. Bortak, Plymouth; Edward N. Balko, Riverview; Albert J. Schweickart, Southgate, and Stephen M. Collins, Trenton, all of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Dec. 23, 1974, Ser. No. 535,321
Int. Cl.² C25C 7/04, 7/00
U.S. Cl. 204—268 8 Claims



1. In a bipolar filter press cell of the type having an anode and a cathode separated by a central barrier and being electrically-mechanically connected through a boss, the improvement which comprises:

the cathode comprising a plurality of segments, each segment having at least two bosses associated therewith,

the anode comprising a plurality of segments, each segment having at least two bosses associated therewith, and

wherein the segments are oriented such that at least one boss of each one electrode segment is connected to a boss of a different electrode segment than the other bosses on the one electrode segment.

3,960,700

COAL HYDROGENATION TO PRODUCE LIQUIDS

Bernard H. Rosen, Little Silver; Arnold H. Pelofsky, East Brunswick, and Marvin Greene, Somerset, all of N.J., assignors to Cities Service Company, Tulsa, Okla.

Filed Jan. 13, 1975, Ser. No. 540,489
Int. Cl.² C10G 1/06
U.S. Cl. 208—8 7 Claims

1. A process of treating carbonaceous material with hydrogen, in the absence of added catalyst, comprising in serial combination,

a. adding liquid or crushed solid carbonaceous material to a reactor,

b. adding hot hydrogen to the stream of carbonaceous material, with the hydrogen/carbonaceous material ratio varying from about 0.05 to about 4,

c. reacting the hydrogen and the carbonaceous material at a temperature of from about 400°C. to about 2,000°C., and a pressure of from about 500 to about 5,000 psig., and

d. quenching the mixture, with the total residence time varying from about 2 milliseconds to about 2 seconds.

3,960,701

HYDROGENATION OF COAL TO PRODUCE COKE, PITCH AND ELECTRODE CARBON

Wilburn C. Schroeder, 7316 Radcliffe Drive, College Park, Md. 20740

Continuation-in-part of Ser. No. 476,105, June 3, 1974. This application Dec. 2, 1974, Ser. No. 528,629
The portion of the term of this patent subsequent to Nov. 4, 1992, has been disclaimed.
Int. Cl.² C10G 1/04
U.S. Cl. 208—8 11 Claims

1. A method for preparation of low sulfur pitch, coke and aromatic oils from sulfur-containing coal comprising introducing said coal in the absence of a pasting oil into a hydrogenation zone of a closed cyclic system having hydrogenation, purifying and oxygen-steam reforming zones, said system being maintained at a pressure in the range of about 500 to 4000 psi, hydrogenating said coal in the hydrogenation zone at a temperature in the range of about 820° to 1000°F with hot hydrogencontaining gases from the reforming zone, said gases also containing carbon monoxide and excess steam, to provide an effluent stream containing excess hydrogen, gaseous hydrocarbons, a heavy carbonaceous liquid and solids fraction, and gaseous impurities including sulfur compounds, removing the heavy, carbonaceous liquid and solids fraction from said effluent stream without substantial reduction in system pressure, removing sulfur compounds from the resulting gaseous stream without substantial reduction in system pressure, introducing the resulting purified gaseous stream, steam and oxygen into said reforming zone to provide the hot hydrogen-containing gases for introduction into said hydrogenation zone, and removing distillable oils from said carbonaceous liquid fraction to produce pitch or coke and aromatic oils.

3,960,702

VAPOR PHASE WATER PROCESS FOR RETORTING OIL SHALE

Victor D. Allred, Littleton, Colo., assignor to Marathon Oil Company, Findlay, Ohio

Filed Aug. 8, 1974, Ser. No. 495,483
Int. Cl.² C10G 1/02
U.S. Cl. 208—11 R 6 Claims

1. In a process for the recovery of organic values from oil shale by contacting said oil shale with superheated water vapor, the improvement comprising enhancing the recovery of said hydrocarbon values by, in combination,

a. contacting particles of said oil shale with said superheated water vapor at a surperficial gas velocity of at least 20 feet per minute and at a pressure in the range of from about 1 to about 150 p.s.i.a.,

b. providing said contact with said superheated water vapor at a temperature of from about 850° to 950°F., to produce an effluent stream comprising superheated water vapor, hydrocarbon vapors, hydrogen, and carbon oxides.

3,960,703

PROCESS FOR THE PURIFICATION OF SLACK WAXES

Maximilian Dielacher, Hamburg, and Uwe Hansen, Jesteburg, both of Germany, assignors to Deutsche Texaco Aktiengesellschaft, Hamburg, Germany

Filed Dec. 20, 1974, Ser. No. 534,962
Claims priority, application Germany, Dec. 22, 1973, 2364333
Int. Cl.² C10G 43/02
U.S. Cl. 208—26 16 Claims

1. A process for the purification of slack wax containing aromatic compounds which comprises the following steps:

a. contacting an aromatic-containing slack wax in the liquid phase with a macroporous, metal ion loaded, cationic exchange resin at a temperature above the melting point of the slack wax whereby aromatics are adsorbed by the resin,

b. contacting the resin with a paraffinic hydrocarbon whereby residual quantities of the slack wax charge are displaced,

c. contacting the resin with a polar organic solvent whereby the adsorbed aromatics are desorbed, and

d. contacting the resin with a paraffinic hydrocarbon whereby residual quantities of the polar organic solvent are displaced.

3,960,704

MANUFACTURE OF ISOTROPIC DELAYED PETROLEUM COKE

William H. Kegler, Ponca City, Okla., and Marvin E. Huyser, Houston, Tex., assignors to Continental Oil Company, Ponca City, Okla.

Filed Aug. 27, 1974, Ser. No. 500,985
Int. Cl.² C10G 9/14
U.S. Cl. 208—50 2 Claims

1. A process for producing isotropic coke having a CTE ratio of less than 1.5 from reduced virgin crude oil comprising:

a. air blowing said reduced virgin crude oil to a softening point of from 120° to 240°F;

b. heating the air blown reduced virgin crude oil to a temperature of from 850° to 950°F;

c. charging the heated reduced virgin crude oil to a delayed coking drum at a pressure of from 20 to 250 psig with a recycle ratio of from 1.0 to 5.0 to produce isotropic coke therein; and

d. recovering isotropic coke having a CTE ratio of less than 1.5 from the coking drum.

3,960,705

CONVERSION OF FOOTS OIL TO LUBE BASE STOCKS

William E. Garwood, Haddonfield, N.J., and John J. Wise, Media, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 453,246, March 21, 1974, Pat. No. 3,893,906, and a continuation-in-part of Ser. No. 391,380, Aug. 24, 1973, Pat. No. 3,894,939. This application June 17, 1975, Ser. No. 587,760
Int. Cl.² C10G 13/02, 41/00; C10L 1/04
U.S. Cl. 208—111 2 Claims

1. In the process of producing a lubricant base stock and wax from a distillate fraction boiling in the range of about 650° to 1100°F by the sequnce of processing comprising dearomatizing such distillate by solvent extraction, dewaxing said dearomatized distillate by ketone extraction to produce a first product comprising wax and a second product comprising lubricant base stock, and deoiling said first product to produce a hard wax and Foots oil; the improvement which comprises contacting said Foots oil with a crystalline aluminosilicate zeolite having a silica to alumina ratio of at least about 15, a constraint index of 1 to 12, a crystal density of not substantially below about 1.6 grams per cubic centimeter and a hydrogenation/dehydrogenation component in a proportion of up to about 10 weight percent, said contact being carried out at about 500° to 800°F, about 0.5 to 20 LHSV, under a hydrogen pressure of about 250 to 750 psig, and at a hydrogen circulation rate of about 500 to 2,500 SCFB and resolving the product of such contact into at least a lubricant base stock fraction and a light fraction comprising LPG and naphtha.

3,960,706

PROCESS FOR UPGRADING A HYDROCARBON FRACTION

John D. McCollum, Munster, Ind., and Leonard M. Quick, Park Forest South, Ill., assignors to Standard Oil Company, Chicago, Ill.

Filed May 31, 1974, Ser. No. 474,927
Int. Cl.² C10G 13/06, 17/00, 23/00
U.S. Cl. 208—112 22 Claims

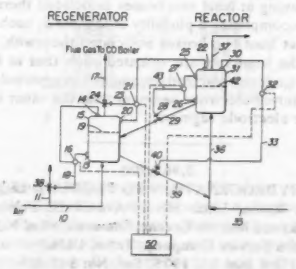
1. A process for cracking, hydrogenating, desulfurizing, demetalating, and denitrifying a hydrocarbon fraction containing paraffins, olefins, olefin-equivalents, or acetylenes, as such or as substituents on ring compounds, and sulfurous, metallic and nitrogenous components: comprising cracking hydrogenating, desulfurizing, demetalating, and denitrifying said hydrocarbon fraction by contacting said hydrocarbon fraction with a water-containing fluid at a temperature in the range of from about 600° to about 900°F., under super-atmospheric pressure, in the absence of externally supplied hydrogen, and in the presence of an externally supplied catalyst system containing a sulfur- and nitrogen-resistant catalyst selected from the group consisting of at least one soluble or insoluble transition metal compound and transition metal deposited on a support, said transition metal in said catalyst being selected from the group consisting of ruthenium, rhodium, iridium, osmium, and combinations thereof, wherein sufficient water is present in the water-containing fluid and said pressure is sufficiently high so that the water in the water-containing fluid has a density of at least 0.10 gram per milliliter and serves as an effective solvent for the hydrocarbon fraction, and wherein hydrogen is generated in situ; and lowering said temperature or pressure or both to thereby make the water in the water-containing fluid a less effective solvent for the hydrocarbon fraction and to thereby form separate phases, wherein essentially all the sulfur separated from the hydrocarbon fraction is in the form of elemental sulfur.

3,960,707

SIMULATION OF CATALYTIC CRACKING PROCESS

Benjamin Gross; Solomon M. Jacob, both of Cherry Hill; Donald M. Nace, Woodbury, all of N.J., and Sterling E. Voltz, Media, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 472,525, May 23, 1974, which is a continuation of Ser. No. 148,051, May 28, 1971, abandoned. This application Dec. 3, 1974, Ser. No. 529,055
Int. Cl.² C10G 9/32
U.S. Cl. 208—113 6 Claims



1. In the catalytic cracking of a feed stream having a multiplicity of hydrocarbons having various boiling ranges by con-

tacting such hydrocarbons with an active hydrocarbon cracking catalyst under catalytic cracking conditions to convert said hydrocarbons to cracked product and to contaminate said catalyst with coke deposited thereon; and controlling the product produced responsive to the boiling range of said multiplicity of hydrocarbons; the improvement which comprises lumping said hydrocarbons both kinetically and according to boiling range as:

P_l = Wt. % paraffinic molecules, (mass spec analysis), 430°–650°F

N_l = Wt. % naphthenic molecules, (mass spec analysis), 430°–650°F

C_{Al} = Wt. % carbon atoms among aromatic rings, (n-d-M method), 430°–650°F

A_l = Wt. % aromatic substituent groups (430°–650°F)

P_h = Wt. % paraffinic molecules, (mass spec analysis), 650°F+

N_h = Wt. % naphthenic molecules, (mass spec analysis), 650°F+

C_{Ah} = Wt. % carbon atoms among aromatic rings, n-d-M method, 650°F+

A_h = Wt. % aromatic substituent groups (650°F+) and wherein the yields of said products are lumped as:

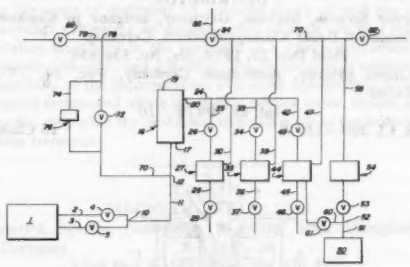
G = G lump (C_5+ − 430°F)

C = C lump (C_1–C_4 + coke) and controlling the reaction conditions of said catalytic cracking reaction responsive to the invariant predetermined simultaneous and consecutive reactions characteristic of said proportions in said lumps to maximize yields therefrom.

3,960,708
PROCESS FOR UPGRADING A HYDROCARBON FRACTION

John D. McCollum, Munster, Ind., and Leonard M. Quick, Park Forest South, Ill., assignors to Standard Oil Company, Chicago, Ill.

Filed May 31, 1974, Ser. No. 474,913
Int. Cl.² C01G *11/02, 17/00*
U.S. Cl. 208—121 17 Claims



1. A process for cracking, desulfurizing, and demetalating a hydrocarbon fraction containing paraffins, olefins, olefin-equivalents, or acetylenes, as such or as substituents on ring compounds, and sulfurous and metallic components: comprising cracking, desulfurizing, and demetalating said hydrocarbon fraction by contacting said hydrocarbon fraction with a water-containing fluid at a temperature in the range of from about 600°F. to about 900°F., under super-atmospheric pressure, in the absence of externally supplied hydrogen, and in the presence of an externally supplied sulfur-resistant catalyst selected from the group consisting of at least one basic metal carbonate, basic metal hydroxide, transition metal oxide, oxide-forming transition metal salt, and combinations thereof, wherein the metal in the basic metal carbonate and hydroxide is selected from the group consisting of alkali metals, wherein the transition metal in the oxide and salt is selected from the group consisting of a transition metal of Group IVB, VB, VIB, and VIIB of the Periodic Chart, and wherein sufficient water is present in the water-containing fluid and said pressure is sufficiently high so that the water in the water-containing fluid has a density of at least 0.10 gram per milliliter and serves as an effective solvent for the hydrocarbon fraction; and lowering said temperature or pressure or both to thereby make the water in the water-containing fluid a less effective solvent for the hydrocarbon fraction and to thereby form separate phases, wherein essentially all the sulfur separated from the hydrocarbon fraction is in the form of elemental sulfur.

3,960,709
HYDROCARBON CONVERSION WITH A TRIMETALLIC CATALYTIC COMPOSITE

John C. Hayes, Palatine, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Continuation-in-part of Ser. No. 391,428, Aug. 24, 1973, abandoned, which is a division of Ser. No. 225,634, Feb. 11, 1973, Pat. No. 3,775,301, which is a division of Ser. No. 839,086, July 3, 1969, abandoned. This application June 3, 1974, Ser. No. 475,691
Int. Cl.² C10G *35/08*
U.S. Cl. 208—139 12 Claims

1. A process for reforming a gasoline fraction to produce a high octane reformate which comprises contacting the gasoline fraction at reforming conditions in the presence of hydrogen with a catalytic composite comprising a porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt. % platinum or palladium, about 0.01 to about 2 wt. % rhodium, about 0.01 to about 5 wt. % germanium and about 0.1 to about 3.5 wt. % halogen, wherein the platinum or palladium, rhodium and germanium are uniformly dispersed throughout the porous carrier material, wherein substantially all of the platinum or palladium and rhodium are present in the corresponding elemental metallic states and wherein substantially all of the germanium is present in an oxidation state above that of the elemental metal.

3,960,710
HYDROCARBON CONVERSION WITH AN ACIDIC MULTIMETALLIC CATALYTIC COMPOSITE

Ernest L. Pollitzer, Skokie, and John C. Hayes, Palatine, both of Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

Filed Nov. 8, 1974, Ser. No. 522,209
Int. Cl.² C10G *35/08*
U.S. Cl. 208—139 18 Claims

1. A process for producing a high octane reformate which comprises contacting a gasoline fraction at reforming conditions with an acidic catalytic composite comprising a porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt. % platinum group metal, about 0.5 to about 5 wt. % cobalt, about 0.01 to about 5 wt. % tin and about 0.1 to about 3.5 wt. % halogen, wherein the platinum group metal, cobalt and tin are uniformly dispersed throughout the porous carrier material, wherein the average crystallite size of the cobalt and tin is less than 100 Angstroms in maximum dimension, wherein substantially all of the platinum group metal is present in the elemental metallic state, wherein substantially all of the tin is present in an oxidation state above that of the elemental metal, and wherein substantially all of the cobalt is present in the elemental metallic state or in a state which is reducible to the elemental metallic state under reforming conditions.

3,960,711

HYDROCARBON CONVERSION WITH AN ACIDIC MULTIMETALLIC CATALYTIC COMPOSITE

George J. Antos, Arlington Heights; John C. Hayes, Palatine, and Ernest L. Pollitzer, Skokie, all of Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

Filed Apr. 2, 1975, Ser. No. 564,386
Int. Cl.² C10G 35/08, 13/10; C07C 5/30
U.S. Cl. 208—139 23 Claims

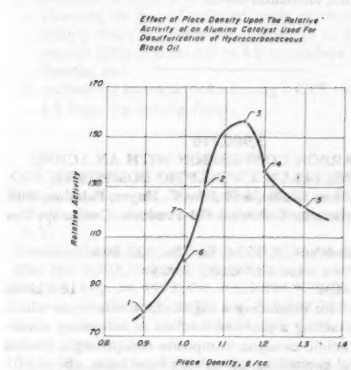
1. A process for converting a hydrocarbon which comprises contacting the hydrocarbon at hydrocarbon conversion conditions with an acidic catalytic composite comprising a porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt. % platinum group metal, about 0.01 to about 2 wt. % rhenium, about 0.05 to about 5 wt. % cobalt, about 0.01 to about 5 wt. % tin, and about 0.1 to about 3.5 wt. % halogen, wherein the platinum group metal, rhenium, cobalt, and tin are uniformly dispersed throughout the porous carrier material, wherein the average crystallite size of the cobalt and tin is less than 100 Angstroms in maximum dimension wherein substantially all of the platinum group metal is present in the elemental metallic state, wherein substantially all of the tin is present in an oxidation state above that of the elemental metal, and wherein substantially all of the cobalt and rhenium are present in the corresponding elemental metallic state or in a state which is reducible to the corresponding elemental metallic state under hydrocarbon conversion conditions or in a mixture of these states.

3,960,712

HYDRODESULFURIZATION OF ASPHALTENE-CONTAINING BLACK OIL WITH A GAMMA-ALUMINA COMPOSITE CATALYST OF SPECIFIED PARTICLE DENSITY

John E. Conway, La Grange, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Continuation-in-part of Ser. No. 356,013, April 30, 1973, abandoned. This application Jan. 8, 1975, Ser. No. 539,466
Int. Cl.² C10G 23/02
U.S. Cl. 208—216 8 Claims



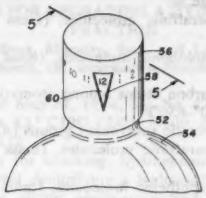
1. In a process for the catalytic hydrodesulfurization of an asphaltene-containing hydrocarbonaceous charge stock in which said charge stock and hydrogen are reacted with a sulfided catalytic particle composite of alumina having combined therewith a metal from Group VI-B and a metal from Group VIII in a reaction zone, the improvement which comprises said catalytic composite particle having a density of from about 1.05 to about 1.24 grams per cubic centimeter wherein the alumina support of said catalyst is gamma-alumina which has an average pore diameter of about 20 to about 300 Angstroms, a pore volume of about 0.1 to about 1 ml./gm., and a surface area of about 100 to about 500 m²/gm.

3,960,713

MEDICATION TIMING SEALING DEVICE

Helen L. Carey, Brooklyn, N.Y., assignor to The Raymond Lee Organization, Inc., a part interest

Filed Aug. 16, 1974, Ser. No. 497,927
Int. Cl.² B65D 51/24, 85/56; G09F 9/00
U.S. Cl. 206—534 2 Claims



1. A medication timing sealing device for a container of medicine having an open neck having an outer thread, said device comprising:

a first vertical hollow cylinder closed at its top end and open at its bottom end, said first cylinder having a thread on its inner cylindrical wall, said first cylinder being threadedly and removably screwed into said neck, said first cylinder having peripherally positioned equidistantly separated numbers from one to twelve disposed along a horizontal circle on the outer cylindrical surface of the first cylinder; and

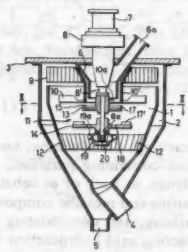
a second vertical hollow cylinder closed at its top end and open at its bottom end, the second cylinder being snap fitted over the first cylinder, the second cylinder having a viewing window in its cylindrical surface which is aligned with and exposes to view any selected one of said numbers.

3,960,714

CENTRIFUGAL SEPARATOR WITH ROTARY DISTRIBUTOR

Werner Strauss, Bochum, Germany, assignor to Klockner-Humboldt-Deutz Aktiengesellschaft, Germany

Filed Dec. 23, 1974, Ser. No. 536,934
Claims priority, application Germany, Dec. 24, 1973, 2364568
Int. Cl.² B07B 7/10
U.S. Cl. 209—139 A 15 Claims



1. A centrifugal separator including a separating chamber, means for charging material into the separating chamber, a rotary distributor in the chamber provided with coaxial rotating distributor disks one of which is smaller than the other of the disks and spaced thereabove, and means for rotatably driving the disks, said smaller disk being located adjacently below and at a fixed elevation relative to said charging means, and air circulation means for separating material in said chamber the improvement comprising:

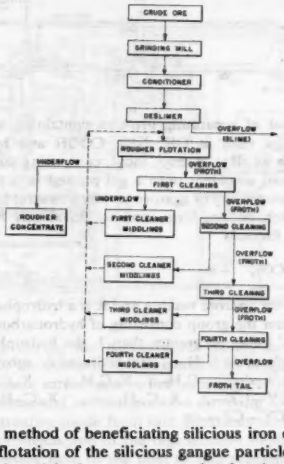
means mounting the larger of the disks for vertical movement toward and away from said smaller disk; and

means for effecting said vertical movements of the larger disk.

3,960,715
CATIONIC FROTH FLOTATION PROCESS

Mason L. Dicks, Keewatin, and James B. Morrow, Hibbing, both of Minn., assignors to The Hanna Mining Company, Cleveland, Ohio

Filed Jan. 7, 1974, Ser. No. 431,292
Int. Cl.² B03D 1/02
U.S. Cl. 209—166 **6 Claims**



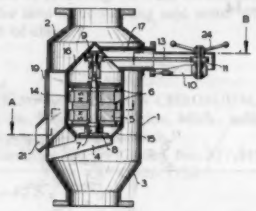
1. In the method of beneficiating silicious iron ore by cationic froth flotation of the silicious gangue particles from the iron mineral particles in an aqueous pulp of such ore comprising the steps of desliming an aqueous slurry of said ore and thereafter subjecting an aqueous pulp of such ore to a froth-flotation treatment in the presence of a starch depressant, a cationic collector, and a frother, the improvement consisting essentially of the incorporation of a small amount of a Group II metal compound which is a halide, sulfate, or or, nitrate, salt into the pulp after the desliming step and prior to the froth-flotation treatment.

3,960,716
MAGNETIC SEPARATOR

Heinrich Spodig, Netteberge 84, 4711 Bork, Westphalia, Germany

Filed Dec. 6, 1973, Ser. No. 422,573
Claims priority, application Germany, Dec. 12, 1972, 2260709
Int. Cl.² B03C 1/12
U.S. Cl. 209—220 **16 Claims**

1. A magnetic separator for materials containing magnetically attractable particles, comprising a jacket having an inlet and an outlet; a housing having an axis and an outer surface and so mounted within the confines of said jacket as to be stationary with respect thereto and defining therewith a passage between said inlet and said outlet for gravity movement of the material to be separated in a path; connecting means located in said passage and establishing communication between the interior of said housing and the exterior of said jacket; a shaft mounted in said housing for rotation about said axis; drive means for rotating said shaft and including a drive, and a transmission in said connecting means between said shaft and said drive; and magnetic means mounted on said shaft for shared rotation therewith adjacent said housing, including a plurality of magnet disks and a plurality of pole disks alternating with said magnet disks in the axial direction of said housing, and generating a rotating magnetic field which penetrates through said housing into said path whereby the

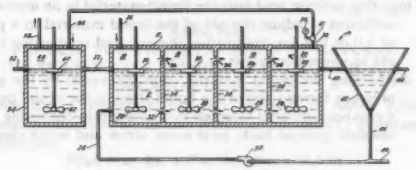


magnetically attractable particles of the material are attracted to said outer surface and dragged along the same circumferentially of said housing to a predetermined location during the rotation of said magnetic means.

3,960,717
PROCESS FOR TREATING WASTE WATER

Kenneth Wyatt, Oswestry, England, assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Continuation of Ser. No. 323,227, Jan. 12, 1973, abandoned. This application June 7, 1974, Ser. No. 477,526
Claims priority, application United Kingdom, Jan. 20, 1972, 2852/72
Int. Cl.³ C02C 1/06
U.S. Cl. 210—6 **8 Claims**



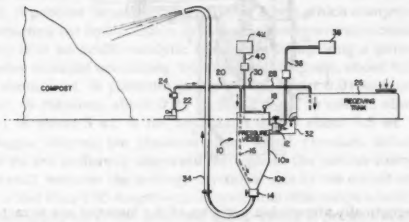
1. An activated sludge process for treating wastewater containing organic matter and dissolved nitrogen gas which comprises the steps of: pretreating said wastewater without the addition of activated sludge in an enclosed wastewater pretreatment zone by contacting said wastewater with an oxygen enriched stripping gas having an oxygen content in excess of the oxygen content of air and having a partial pressure of nitrogen less than the partial pressure of nitrogen in ambient air, stripping at least 25% by weight of said dissolved nitrogen gas from said wastewater by contact with said oxygen enriched stripping gas, venting said stripped nitrogen gas from said pretreatment zone, thereafter feeding said pretreated wastewater and recirculated activated sludge to an enclosed aeration zone to form a mixed liquor in said enclosed aeration zone, introducing an oxygen enriched aeration gas into said enclosed mixed liquor aeration zone, biologically degrading the organic matter contained in said wastewater in contact with oxygen enriched aeration gas in said enclosed mixed liquor aeration zone, discharging said mixed liquor from said mixed liquor aeration zone, separating activated sludge from said discharge mixed liquor, and recirculating separated activated sludge downstream of said pretreatment zone to said mixed liquor aeration zone as said recirculated activated sludge, said oxygen enriched stripping gas comprising at least some oxygen enriched aeration gas withdrawn from said mixed liquor aeration zone.

3,960,718

METHOD AND APPARATUS FOR TREATING LIQUID SEWAGE AND WASTE

Willis R. Lebo, 6510 21st Ave., NE., Tacoma, Wash.

Filed Aug. 5, 1974, Ser. No. 494,742
Int. Cl.[2] C02C *1/08*
U.S. Cl. 210—14 3 Claims



1. A method of treating liquid material consisting essentially of sewage and/or manures having solids therein to make the liquid material usable as a plant nutrient and soil conditioner, comprising:

feeding the liquid material into a cone-shaped pressure vessel,

injecting a stream of pressurized oxygen-containing gas into the pressure vessel near the lower end thereof and tangential to the side walls of the conical portion of the vessel to impart a centrifugal motion to the liquid material and impinge the pressurized gas against the solids in the liquid material with sufficient force to break the solids into small particles, the gas thoroughly aerating the material and pressurizing the vessel with the oxygen-containing gas to a pressure ranging from 4 to 15 psi above the liquid level in the pressure vessel,

injecting sulfuric acid into the liquid material in an amount sufficient to adjust the pH of the liquid material to a pH of 3.0 or less for sterilization thereof, and readjusting the pH to approximately 6 to 7, and

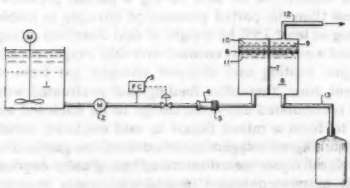
discharging the liquid material from the vessel by the gas pressure formed above the liquid level in the vessel onto a compost material selected from the group consisting of sawdust, ground bark, peat-moss, straw and wood chips.

3,960,719

COALESCENCE FILTER FOR OIL-WATER DISPERSIONS

Clarence R. Bresson, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 6, 1973, Ser. No. 422,317
Int. Cl.[2] B01D *13/00*
U.S. Cl. 210—23 R 6 Claims



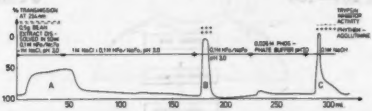
1. A method for agglomerating oil dispersed in water, said method comprising passing a mixture of oil dispersed in water through a coalescing filter, said filter comprising from about three to about 25 strata of about 30 to about 100 mils in thickness for a total thickness of at least 0.5 inch of polypropylene fibers needled to produce a coherent fabric fused on one side only and capcoated with an additional layer of polypropylene fibers needle punched into the unfused side.

3,960,720

GEL PRODUCT FOR SEPARATION PURPOSES AND METHOD OF USING THE PRODUCT FOR HYDROPHOBIC SALTING OUT ADSORPTION

Jerker Olof Porath, and Jan Gunnar Rosengren, both of Uppsala, Sweden, assignors to Exploaterings Aktiebolaget T.B.F., Uppsala, Sweden

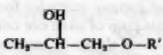
Filed Mar. 19, 1974, Ser. No. 452,519
Claims priority, application Sweden, Mar. 23, 1973, 7304148
Int. Cl.[2] B01D *15/08*
U.S. Cl. 260—112.5 R 4 Claims



1. Method of separating proteins containing both hydrophilic groups such as OH, NH_2, COOH and hydrophobic groups such as alkyl, phenyl, indyl, comprising adsorbing the proteins from a solvent onto a gel packed in a column and consisting essentially of agarose to which neutral hydrophobic groups which do not form ions are covalently bonded and having the formula

$$P—O(CO)_{n'}—R$$

where P is the agarose residue and R is a hydrophobic radical selected from the group consisting of hydrocarbon and ether residues, n' being no greater than 1, the hydrophobic group having the formula C_nH_{2n+1} unsubstituted or substituted with halogen or hydroxy, C_nH_{2n-1}, $X_mC_6H_{5-m}—$, $X_mC_6H_{5-m}CY—$, $X_mC_6H_{5-m}CY—CZ—$, $X_mC_{10}H_{7-m}—$, $X_mC_{10}H_{7-m}CY—$, $X_mC_{10}H_{7-m}CY—CZ—$ or



where

X is H, C_pH_{2p+1}, CH_3, C_2H_5, OC_pH_{2p+1}, halogen or NO_2,

n is an integer from 1 to 20,

Y and Z are O or H_2,

m is an integer from 0 to 5,

p is an integer from 1 to 10 and

R′ is alkyl, alkenyl, aryl, aralkyl, aralkoxy, alkaryl, unsubstituted or substituted with hydroxy, halogen or nitro, the alkyl portions of R′ containing 1–20 carbon atoms, and desorbing the adsorbed material by lowering of the ion strength and/or changing the pH and/or lowering the polarity of the solvent.

3,960,721

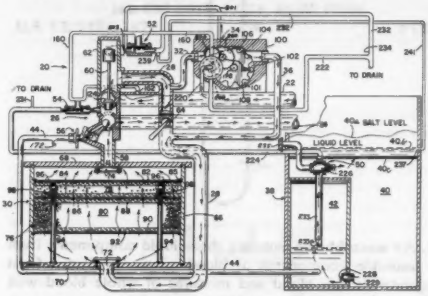
FLUID TREATING APPARATUS AND METHOD

Don E. Heskett, Villa Park, Ill., assignor to Fluid Power Research, Inc., Villa Park, Ill.

Filed June 15, 1973, Ser. No. 370,235
Int. Cl.[2] B01D *15/04*, *15/06*
U.S. Cl. 210—25 40 Claims

1. A fluid treating apparatus comprising, in combination, apparatus inlet means connecting said apparatus to a supply of line pressure fluid to be treated therewith, chamber means containing a bed of fine mesh surface active fluid treating particles to be contacted by said fluid for providing a desired treatment to said fluid during a treating mode, the treating capacity of said particles becoming exhausted during use and being restorable by contacting said particles with a regenerating fluid, said fine mesh particles in said bed having a particle size of 50 mesh or smaller, measured on a dry basis, fluid inlet and outlet passages communicating with said chamber means,

said chamber means being constructed and arranged to permit flow of fluid through said bed of fine mesh surface active fluid treating particles and to prevent the escape of said fine mesh surface active fluid treating particles therefrom, means for storing a body of a regenerating fluid for regenerating said fine mesh surface active fluid treating particles, said regenerating fluid storage means including an inlet and outlet between which said body of regenerating fluid is interposed, means communicating said line pressure fluid with the inlet to said regenerating fluid storage means to charge said regeneration fluid storage means with line pressure during a regeneration mode, means communicating the outlet of said regenerating fluid storage means with said chamber means for feeding regenerating fluid to said fine mesh surface active fluid treating particles during the regeneration mode, meter means responsive to the cumulative volume of fluid supplied to said bed of fine mesh surface active fluid treating particles in said chamber means, and switching means directing line pressure fluid in the treating mode from said apparatus inlet means to said chamber means and in the regeneration mode directing said line pressure fluid to the inlet of said regenerating fluid storage means for charging said regenerating fluid under the direct driving force of said line pressure fluid to said bed of fine mesh surface active fluid treating particles in said chamber means, said switching means being responsive to said meter means, whereby said apparatus will be switched from a treating mode to a regenerating mode after treatment of a predetermined volume of said fluid.



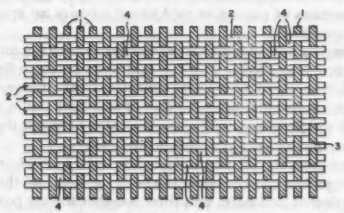
3,960,722
OIL ADSORBENT

Masami Tomikawa; Akiji Tsunoda; Kazuhisa Kaneda; Hideo Ohkawa, and Yutaka Mugino, all of Chiba, Japan, assignors to Idemitsu, Kosan Kabushiki Kaisha (Idemitsu Kosan Co., Ltd.), Japan

Continuation of Ser. No. 363,389, May 24, 1973, abandoned. This application Jan. 27, 1975, Ser. No. 544,301

Int. Cl.² C02B 9/02

U.S. Cl. 210—36 **6 Claims**



1. A material for absorbing oil from oil-contaminated water comprising an openwork assembly of elongated strands in intimate contact, said strands having a diameter of about 1–5 mm and being formed of a flexible foam comprising a physically foamed mixture consisting essentially of about 20–70% of a non-crosslinked polyethylene resin and distributed uniformly through said resin about 80–30% of inorganic calcium compound particles, said percentages being by weight.

6. A method of removing oil from oil-contaminated water comprising the step of contacting said water with the absorbent material of claim 1.

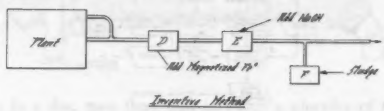
3,960,723
MAGNETIZATION OF IRON CHROMIUM SYSTEM

James W. Butler, Dearborn Heights, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 26, 1972, Ser. No. 317,919

Int. Cl.² C02B 1/20

U.S. Cl. 210—42 S **7 Claims**



1. A method of treating waste water containing solutes from the group consisting of chromium, copper, nickel, lead and tin, and a complexing agent for said solute, the method comprising:

a. introducing magnetized ferrous particles to said waste water,

b. adjusting the pH of said water at least above 6.3 whereby compounds formed from said solute are optimally precipitated to produce a water purity characterized by a copper concentration less than 1 ppm, a trivalent chromium concentration less than 2.1 ppm, and a nickel concentration less than 1.0 ppm.

3,960,724
PROCESS FOR THE SEPARATION OF NATURAL WATER-SOLUBLE ALUMINUM HYDROSILICATE ORGANO-COMPLEXES

Janos Barna, Budapest, Hungary, assignor to Novex Talalmanyfejleszto es Ertekesito Kulkereskedelmi Rt., Budapest, Hungary

Filed May 22, 1974, Ser. No. 472,508

Int. Cl.² B01D 43/00

U.S. Cl. 210—49 **4 Claims**

1. A mechano-chemical activation process for the separation of peptisable natural aluminium hydrosilicate organo-complex from brown coal, characterized by milling brown coal to a size smaller than 60 microns, admixing the milled brown coal with water, vigorously mechanically agitating the mixture of brown coal and water at 60 to 120°C. so as to dissociate to the colloidal state, in the course of which the hydrophilic binding positions of the materials are loosened by hydration, and finally separating the thus-formed peptised solution from insoluble material.

3,960,725
METHOD FOR SLUDGE TREATMENT

Gote Herbert Egard Bjermo, and Paul Einar Tresjo, both of Vasteras, Sweden, assignors to System AB Infoteknik, Vasteras, Sweden

Filed Oct. 31, 1974, Ser. No. 519,559

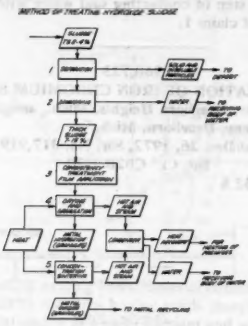
Claims priority, application Sweden, Nov. 5, 1973, 7314962-7

Int. Cl.² C02C 5/06

U.S. Cl. 210—67 **4 Claims**

1. A method of converting metal hydroxides in sludge to a non-polluting product comprising: separating the sludge from waste water containing the metal hydroxide therein; dewatering said sludge to a thixotropic consistency; conveying the thixotropic sludge to a heating device; applying the thixo-

tropic sludge in a thin layer having a thickness between about 1 mm. and 5 mm. onto a conveyor; conveying the thin layer of thixotropic sludge through the heating device and applying heat therein to thereby form small particles of metal hydroxide; scraping the small particles of metal hydroxide from the conveyor and transferring the small particles to a sintering



device; compacting the small particles of metal hydroxide before sintering; and conveying the compacted metal hydroxide through the sintering device and applying heat therein to form a metal oxide in powder or granular form, said step of dewatering the sludge to a thixotropic consistency comprising forming a sludge having a water content greater than 85% by weight of the sludge.

3,960,726

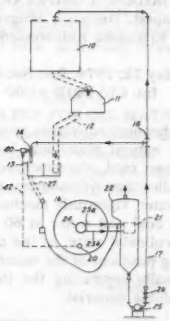
AUTOMATIC FILTER LEVEL CONTROL BY DILUTION WITH FILTRATE

C. Lynn Peterson, Salt Lake City, Utah, assignor to Peterson Filters and Engineering Co., Salt Lake City, Utah

Filed July 28, 1971, Ser. No. 166,806

Int. Cl.² B01D *33/02*

U.S. Cl. 210—77 **9 Claims**



9. The method of maintaining a predetermined slurry level in a slurry tank of a vacuum filter unit in a range between a predetermined low level and a predetermined high level comprising:

providing a slurry source and connecting the slurry source to the slurry tank by passage means therebetween,

removing filtrate from the filter unit and delivering at least a portion of the filtrate to the passage means and mixing the filtrate with the source slurry to vary slurry level in the slurry tank, and

automatically controlling the amount of filtrate delivered to and mixed with the source slurry by control signal responsive means in accordance with the level of slurry in the slurry tank continuously operable during filter unit operation providing continuous control signals for the control signal responsive means.

3,960,727

APPARATUS AND METHOD FOR ISOLATING SOLUBLE BLOOD COMPONENTS

Harry T. Hochstrasser, 47 Summit Drive, Hastings-on-Hudson, N.Y. 10706

Filed Aug. 9, 1974, Ser. No. 496,030

Int. Cl.² B01D *33/00*

U.S. Cl. 210—78 **11 Claims**

1. An assembly for isolating the soluble components from the insoluble components of blood mixtures selected from coagulated whole blood and mixtures of whole blood with anti-coagulants which comprises:

i. a blood collection container for holding a blood specimen to be separated and having an opening therein; and

ii. a separating apparatus inserted in the opening of said container, having a diameter less than the width of said collection chamber so that said apparatus fits loosely within said collection container and does not form an interference fit with the inner walls of said container; said apparatus comprising:

an elongate body defining a central bore which has an upper portion and a lower portion; said body having a first end which is open and communicates freely between the exterior and the upper portion of said bore and a second end which is open and communicates between the exterior and the lower portion of said bore;

a filter member located adjacent to said second end and being interposed between the body exterior and the lower portion of said bore, said filter member having pore sizes which permit the passage of soluble blood components but prevent passage of insoluble blood components; and

said apparatus having a specific gravity of between 0.3–1.3.

8. A method of isolating the soluble components from the insoluble components of a blood mixture held in a blood collection container and which is selected from coagulated whole blood and mixtures of whole blood with anti-coagulants which consists of placing in said blood mixture an apparatus which comprises;

an elongate body defining a central bore which has an upper portion and a lower portion; said body having a first end which is open and communicates freely between the exterior and the upper portion of said bore and a second end which is open and communicates between the exterior and the lower portion of said bore;

a filter member located adjacent to said second end and being interposed between the body exterior and the lower portion of said bore, said filter member having pore sizes which permit the passage of soluble blood components but prevent passage of insoluble blood components;

said apparatus having a specific gravity of between about 0.3 and 1.3; said apparatus having a diameter which is

less than the width of said collection container so that said apparatus is loosely disposed within said blood collection container when emplaced in said blood mixture and does not form an interference fit with the inner walls of said container; and

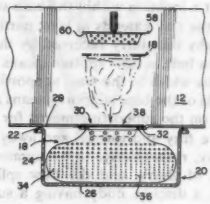
centrifuging said blood mixture with said apparatus emplaced thereon.

3,960,728

DISPOSABLE FILTER APPARATUS

Karl G. Otzen, Brookfield, Wis., assignor to Safety-Kleen Corporation, Elgin, Ill.

Filed Mar. 12, 1975, Ser. No. 557,499
Int. Cl.² B01D *23/04*; B65D *29/04*
U.S. Cl. 210—167 5 Claims



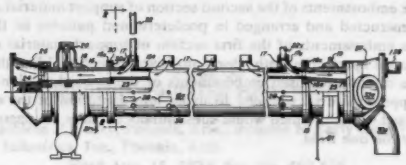
1. A parts washer apparatus comprising in combination a receptacle for receiving a solvent and having means therein for accommodating the parts to be washed and a reservoir for containing a quantity of the solvent, means for circulating the solvent from said reservoir to said receptacle, said receptacle having an opening providing communication for passage of said solvent between said receptacle and said reservoir, and a filter unit disposed within said opening, said filter unit including a collar element in the form of a ring substantially rigid material for locating said filter unit within said opening, and a filter bag portion formed of an impermeable and softenable plastic material, said filter bag having a neck portion secured to said collar element and enlarged upper and lower body portions depending therefrom, said neck portion having solvent by-pass openings therein and said upper and lower body portion having openings therein which are of smaller size than said solvent by-pass openings, said filter bag having openings of the smallest size in said lower body portion which openings are sufficiently small to retain in said bag very fine particles of solid material which are suspended in said solvent, said openings in said upper body portion being of size sufficient to retain in said bag larger particles of said material which are carried by said solvent, said openings being adapted to be reduced in size by particles of said solid material lodging therein, whereby to provide a further effective subdivision of said openings by said particles of material so that said filter mesh size is effectively reduced as filtered particles are trapped therein, and the rate of solvent passage through the lower body of said filter is reduced sufficiently to enable said filter to separate said material by sedimentation.

3,960,729

FLOW CONDUCTING CONNECTORS FOR DISC FILTER SECTORS AND INTERNAL PASSAGES OF FILTER SHAFT

C. Lynn Peterson, and Clarence J. Peterson, both of Salt Lake City, Utah, assignors to Peterson Filters and Engineering Co., Salt Lake City, Utah

Continuation of Ser. No. 185,707, Oct. 1, 1971, abandoned, which is a division of Ser. No. 863,947, Oct. 6, 1969, Pat. No. 3,659,716. This application Sept. 24, 1973, Ser. No. 400,128
Int. Cl.² B01D *33/38*, *33/26*
U.S. Cl. 210—232 22 Claims



1. In a disc type filter unit in which a plurality of filter segment assemblies are mounted on a common shaft means for rotation therewith to form a cake on the filter segment assemblies and to remove filtrate therefrom through radially extending passage means in said filter segment assemblies and through axially extending passage means in said shaft means, the improvement of passage connecting means for each of said filter segment assemblies mounted on the outer periphery of said shaft means and comprising:

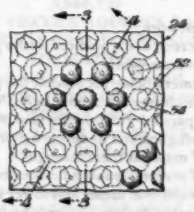
a filtrate passage having an inlet opening connected to said radially extending passage means and an outlet opening connected to said axially extending passage means, and filtrate flow direction changing means in said filtrate passage to change the radial direction of filtrate flow from said radially extending passage means to an axial direction of flow in said axially extending passage means.

3,960,730

EMBOSSED SUPPORT FOR DIALYZER MEMBRANE

Frederick W. Miller, III, Glenmore, Pa., assignor to Extracorporeal Medical Specialties Inc., King of Prussia, Pa.

Filed Sept. 26, 1974, Ser. No. 509,671
Int. Cl.² B01D *31/00*
U.S. Cl. 210—321 A 9 Claims



1. A mass transfer device comprising a first section of membrane material and a second section of membrane material positioned in close opposition to each other to provide between their inner surfaces a passage for one fluid, a first section of support material adjacent the first section of membrane material and a second section of support material adjacent the second section of membrane material to define the passage for the one fluid between the inner surfaces of the sections of membrane material and to provide passage for another fluid against the outer surfaces of the sections of membrane material, the first section of support material including a plurality of embossments the summits of which

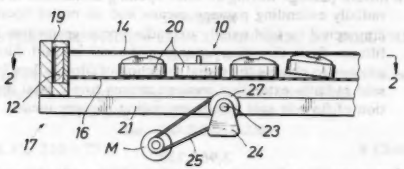
engage the outer surface of the first section of membrane material and the second section of support material including a plurality of opposed embossments the summits of which engage the outer surface of the second section of membrane material to produce contact between the first and second sections of membrane material at spaced intervals within the passage for the one fluid for controlling the thickness dimension of the passage for the one fluid and to permit multi-axial distention of the sections of membrane material into the passage for the other fluid surrounding each embossment for controlling the effective permeability of the sections of membrane material, the improvement being characterized in that the embossments of the first section of support material and the embossments of the second section of support material are constructed and arranged in predetermined patterns so that the embossments of the first section of support material are spaced apart differently along any given directional line than the directly opposed embossments of the second section of support material whereby to avoid interdigitation of the opposed summits which would substantially occlude the passage for the one fluid.

3,960,731

SELF CLEANING SCREEN ASSEMBLY

Louis K. Brandt, 6300 Milvale, Houston, Tex. 77017

Filed Nov. 29, 1974, Ser. No. 528,463
Int. Cl.² B07B *1/48*; B01D *29/04*
U.S. Cl. 210—332 18 Claims



1. An orbital oscillating separator mechanism having screen support means and means for imparting orbital oscillation to said screen support means, said screen support means retaining a self cleaning screen assembly, said screen assembly comprising:

a screen framework;

a separator screen being secured at the periphery thereof to said screen framework;

a support element being secured at the periphery thereof to said screen framework and being disposed in spaced generally parallel relation to said screen, said support element being formed to define a plurality of openings for passage of material therethrough;

a plurality of screen cleaning devices being disposed in the space between said upper and lower screens, each of said screen cleaning devices having a body portion, the height of said body portion being less than the spacing of said screen and support plate and the width of said body portion being greater than the spacing of said screen and support plate; and

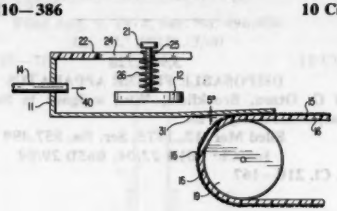
scraper blade means being connected to said body portion of said screen cleaning device with the upper portion of said scraper blade means being disposed above the upper portion of said body portion, said scraper blade means defining at least one elongated scraping surface for scraping engagement with the lower surface of said screen as said mechanical separator is operated with a scraping action that removes material from the underside of said screen.

3,960,732

SYSTEM FOR DEWATERING DILUTE SLURRIES

Thomas E. Lippert, Monroeville, and Michael C. Skriba, Pittsburgh, both of Pa., assignors to The United States of America as represented by the Administrator of the Environmental Protection Agency, Washington, D.C.

Filed Nov. 1, 1974, Ser. No. 520,218
Int. Cl.² B01D *33/36*, *33/38*
U.S. Cl. 210—386 10 Claims



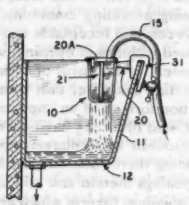
1. An apparatus for dewatering a dilute slurry, including a base support having side walls and opposite ends, at least one endless belt mounted in the base support for movement longitudinally thereof and with which the slurry makes contact for removal of water, a feed tray having side walls, a bottom wall and a mouth end, means fixing the feed tray to one end of the base support at a location within the base support so that the mouth end of the tray extends at least partially over the endless belt whereby the slurry received by the feed tray is fed into the endless belt, a flow splitter means for spreading the slurry across the width of the tray, supporting means secured to the side walls of the base support, means mounting the flow splitter means on the supporting means for adjustment longitudinally of the tray and toward and away from the bottom wall of the tray, respectively, to accommodate varying flow rates or types of slurry, and the flow splitter means being constituted by a disclike body having a substantially planar lower surface arranged in parallelism to the bottom wall of the tray.

3,960,733

FILTER UNIT FOR WASHING MACHINE

Harry M. Van Dieren, 3137 W. 100th St., Evergreen Park, Ill. 60622

Filed Jan. 29, 1975, Ser. No. 545,098
Int. Cl.² B01D *23/00*
U.S. Cl. 210—460 2 Claims



1. A filter unit for filtering the lint from liquid washing machine effluent, comprising:

a. a substantially rigid frame,

b. said frame including a generally horizontal upper rim,

c. said frame further including a plurality of vertically extending, horizontally spaced frame elements depending from said rim,

d. said frame also including horizontally disposed frame elements or portions thereof forming a bottom of the frame,

e. a filter screen comprising a wire mesh having predetermined size openings and disposed in said frame so as to depend from said rim,

f. said filter screen extending between and supported by said frame elements whereby an open mouth is defined by said rim,

g. said frame adapted to be seated in a drain tub on one side thereof whereby liquid effluent introduced to said open mouth through a drain hose passes into the tub leaving particulate matter which is entrained in it on the screen within the filter unit,

h. a removable splash cap seated on said frame rim over said open mouth,

i. said splash cap having an elongated opening formed therein for receiving the end of a drain hose.

3,960,734

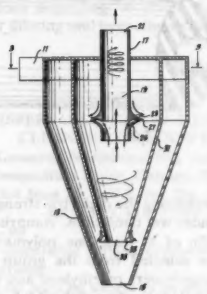
HIGH EFFICIENCY CYCLONE SEPARATOR

Antoni Zagorski, 9431 Julie Beth St., Cypress, Calif. 90630

Continuation-in-part of Ser. No. 295,947, Oct. 10, 1972, abandoned. This application July 8, 1974, Ser. No. 486,307

Int. Cl.² B01D *21/26, 33/02*

U.S. Cl. 210—512 M **11 Claims**



11. An improved cyclone separator of the type having a fluid deflector comprising means adapted to receive a fluid and impart circular motion thereto, and wherein the fluid deflector is attached to and closes the base of a conical container, which container has an outlet at the apex thereof from which unwanted materials and substances of a mass and density greater than the fluid may exit and be removed from the fluid and wherein a fluid conduit is located along the center line of the conical container and passes through the fluid deflector which conduit has one end centrally located within the conical container and the other end located external thereto, and wherein an axial vortex of fluid separated from the unwanted materials and substances is formed in the container, which vortex spirals into the one end of the fluid conduit and exits from the other end, the improvement comprising:

an interceptor ring having outer and inner circumferences, the inner circumference mating with and being circumferentially attached externally to the fluid conduit near the one end of the fluid conduit centrally located within the conical container, said ring extending radially outward from said inner circumference to said outer circumference to intercept fluid which flows longitudinally along the outer surface of the conduit and deflect the longitudinal flow radially outward from the center surface of the conduit whereby unwanted materials and substances are impinged against the conical container interior surface and exit through the apex opening therein; and

a diffuser collar substantially uniformly spaced from the fluid conduit and surrounding the one end of the fluid conduit, said diffuser collar having two ends, one end being attached to said outer circumference of said interceptor ring and having spiral vanes which spiral radially inwardly from said outer circumference to contact and connect to the outer surface of the fluid conduit adjacent said interceptor ring, the other end of the diffuser collar being open, whereby the vortex of fluid which spirals toward the one end of the fluid conduit has the outer layer skimmed therefrom by the uniform space between the fluid conduit and said diffuser collar, which skimmed layer spirals between said diffuser collar and the fluid conduit and is intercepted by said spiral vanes and ejected outwardly into the conical container.

3,960,735

CORROSION-INHIBITED POLYPHOSPHATE COMPOSITIONS

Kathleen P. Lacey, Phoenix, Ariz., assignor to Early California Industries, Inc., Phoenix, Ariz.

Filed Aug. 15, 1974, Ser. No. 497,699

Int. Cl.² A62D *1/00;* **C23F** *11/04, 11/08, 11/10*

U.S. Cl. 252—2 **8 Claims**

1. A composition consisting essentially of

a. ammonium polyphosphate liquid, and

b. an iron cyanide blue,

said iron cyanide blue being present in a minor amount effective to substantially reduce the corrosiveness of said composition to aluminum to less than or equal to 1 mil per year as determined by the "Uniform Corrosion" test set forth in Section 4.3.4 of the "Interim Specification" 5100-00302*a* (June 1972), entitled "Specification for Retardant, Forest Fire, Liquid Chemical, Unthickened for Aircraft or Ground Application," issued by the United States Department of Agriculture, Forest Service.

4. A process for preparing an ammonium polyphosphate liquid having reduced tendency to corrode aluminum, comprising incorporating into said ammonium polyphosphate liquid compounds which react in situ to form a minor effective amount of an iron cyanide blue.

3,960,736

SELF-BREAKING VISCOUS AQUEOUS SOLUTIONS AND THE USE THEREOF IN FRACTURING SUBTERRANEAN FORMATIONS

Dustin L. Free, Tulsa, Okla.; Karl L. Krumel, Midland, Mich., and Travis C. Snyder, Tulsa, Okla., assignors to The Dow Chemical Company, Midland, Mich.

Filed June 3, 1974, Ser. No. 475,702

Int. Cl.² E21B *43/26*

U.S. Cl. 252—8.55 R **18 Claims**

1. A viscous aqueous well treating composition which has a certain viscosity for a predetermined period of time at a certain temperature and which subsequently breaks to form a lower viscosity fluid within a short period of time, which comprises:

a viscous aqueous solution containing a sufficient quantity of a polysaccharide-thickening agent, containing acetal linkages and which, in an aqueous solution is degraded by an acid to provide a solution having a desired viscosity at the temperature of use and an effective quantity of a $C_1 - C_{12}$ organic ester of a carboxylic acid, which hydrolyzes in said aqueous solution at said temperature of use to produce an acid which degrades the polysaccharide and causes the viscosity of the aqueous composition to be lowered to a desired lower level.

3,960,737

NEGATIVELY CHARGED LIQUID DEVELOPER FOR USE IN ELECTROSTATIC PHOTOGRAPHY

Toshiyuki Kawanishi, Tokyo, Japan, assignor to Kabushiki Kaisha Ricoh, Tokyo, Japan

Filed Aug. 13, 1973, Ser. No. 387,773

Claims priority, application Japan, Aug. 17, 1972, 47-81832

Int. Cl.² G03G 9/12

U.S. Cl. 252—62.1 L 20 Claims

1. A negatively charged liquid developer for use in electrostatic photography which comprises a highly insulating carrier liquid and, dispersed therein, a toner comprising colored particles coated with a synthetic polymer composition comprising:

1. a mixture, A, of a copolymer (a) comprising the reaction product of a heteropolymer selected from the group consisting of styrene-butadiene heteropolymers and vinyltoluene-butadiene heteropolymers with an ester monomer selected from the group consisting of alkyl acrylates and methacrylates, wherein the alkyl group contains 6 to 18 carbon atoms; together with
2. a copolymer (b) having a molecular weight of from 5,000 to 30,000 comprising the reaction product of a monomer selected from the group consisting of acrylic and methacrylic acid with an ester monomer selected from the group consisting of alkyl acrylates and methacrylates

wherein the alkyl group contains 6 to 18 carbon atoms: the mixing weight ratio of copolymer (a) to copolymer (b) being from 1:2 to 15:1, the molecular weight of a heteropolymer being from 50,000 to 300,000 and the weight ratio of styrene or vinyltoluene to butadiene being from 1:1 to 9:1 the weight ratio of ester monomer to heteropolymer being from about 0.5:1 to 3:1, the weight ratio of acrylic or methacrylic acid to acid ester being from about 0.05:1 to 0.3:1.

3,960,738

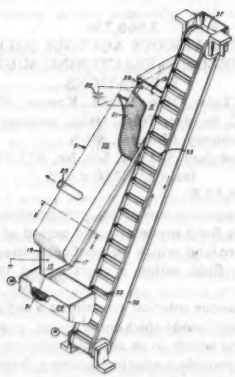
METHOD FOR PRODUCING IMPROVED ELECTROGRAPHIC DEVELOPER

Robert J. O'Brien; Stanley Lelewski, Jr., and Bob A. LaFleur, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 2, 1975, Ser. No. 538,062

Int. Cl.² G03G 9/08; B03C 7/00

U.S. Cl. 252—62.1 P 10 Claims



1. A method for preconditioning an electrographic developer comprising an unconsolidated mass of discrete particles of a carrier and of a toner which carries a charge control agent of a first polarity, said method comprising repeatedly passing a flowing stream of such developer through an electrostatic field between a positive or negative first electrode and a grounded electrode of opposite polarity, and attracting part of said toner particles to the first electrode having polarity opposite the polarity of said charge control agent thereby altering the particle size distribution of the toner and yielding a preconditioned electrographic developer.

3,960,739

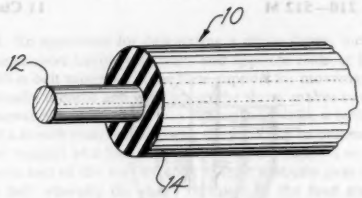
METHOD OF STABILIZING THE DIELECTRIC STRENGTH OF POLYOLEFIN POLYMERS, AND THE STABILIZED COMPOSITIONS AND PRODUCTS THEREOF

Burton Thornley MacKenzie, Jr., Monroe, Conn., assignor to General Electric Company, New York, N.Y.

Filed June 21, 1973, Ser. No. 372,083

Int. Cl.² H01B 3/00, 3/02, 3/24

U.S. Cl. 252—63.2 21 Claims



1. A method of stabilizing the dielectric strength of polyolefin compositions under wet conditions, comprising dispersing through a polyolefin of at least one polymer composition containing ethylene selected from the group consisting of polyethylene and copolymers of ethylene and other halogen free polymerizable materials, at least about 0.5 parts by weight of lead stearate per 100 parts by weight of the polymer containing ethylene.

3,960,740

ANTIFREEZE COMPOSITION

William Lawrence Truett, Blackwood, N.J., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jan. 4, 1974, Ser. No. 430,755

Int. Cl.² C09K 50/00, 3/00

U.S. Cl. 252—73 3 Claims

1. In an undiluted antifreeze solution containing polyhydric alcohol selected from the group consisting of ethylene glycol, propylene glycols, butylene glycols and glycerol, an effective amount of corrosion inhibitor and a dye, the improvement which comprises using as the dye, 1,2-diamino anthraquinone, said dye being present in said antifreeze solution in an amount that is sufficient to give a deep color when said solution is diluted with water to a polyhydric alcohol-water solution of 50-50 volume percent.

3,960,741

ETCHANT FOR REMOVING METALS FROM GLASS SUBSTRATES

Sami I. Gabrail, Syracuse, N.Y., assignor to General Electric Company, Syracuse, N.Y.

Filed Aug. 28, 1974, Ser. No. 501,161

Int. Cl.² C09K 13/08

U.S. Cl. 252—79.3 4 Claims

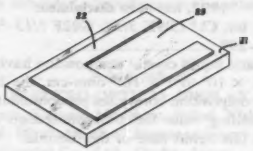
1. An etchant for removing metal from a glass substrate comprising:

hydrofluoric acid for oxidizing said metal to form a metal oxide;

nitric acid for reducing said metal oxide; and

lactic acid for protectively coating said glass substrate and

inhibiting attack thereof by said hydrofluoric acid and nitric acid.



2. An etchant according to claim 1 further comprising acetic acid for diluting said hydrofluoric acid and nitric acid.

3,960,742
WATER-DISPERSABLE SOLVENT EMULSION TYPE CLEANER CONCENTRATE

Edward O. Leonard, Northlake, Ill., assignor to Chemical Cleaning Composition Trust, Chicago, Ill.

Filed June 29, 1973, Ser. No. 375,119
Int. Cl.² C11D *17/00*
U.S. Cl. 252—90 **13 Claims**

1. A water-dispersible solvent emulsion type cleaner concentrate comprising:

a. about 30–60 parts by weight of an ethylene glycol mono(-lower)alkyl ether solvent,

b. about 17–24.5 parts of an alkali hydroxide,

c. about 9–15 parts of a member of the group ammonium and alkali metal metasilicates,

d. a small amount of a nonionic ampholyte selected from the (higher)alkyl betaines and the alkali salts of N-(higher)alkyl beta aminodipropionates, said(higher)alkyl groups having more than 4 and up to about 22 carbon atoms, and

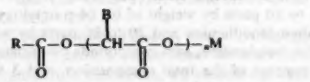
e. a small amount of an anionic hydrotrope selected from the alkali salts of benzene and (lower) alkyl benzene sulfonates, said amounts of (d) and (e) being sufficient to maintain the inorganic ingredients in a stable suspension.

3,960,743
BLEACHING COMPOSITION

Yunosuke Nakagawa, Koshigaya, and Koitsu Sato, Funabashi, both of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Apr. 23, 1974, Ser. No. 463,384
Int. Cl.² C11D *7/54*
U.S. Cl. 252—99 **7 Claims**

1. A bleaching composition capable of being dissolved in water, consisting essentially of from 0.1 to 60 percent by weight of an inorganic peroxide capable of releasing hydrogen peroxide in aqueous solution, and from 0.1 to 50 percent by weight of an activating agent having the formula



wherein R is $ClCH_2$—, CH_3—, $HOCH_2$—, CH_3CH(OH)—,

phenyl or methoxycarbonyl-substituted phenyl; B is hydrogen or alkyl having one to 3 carbon atoms; M is hydrogen, alkyl having 1 to 4 carbon atoms, or an alkali metal; and *n* is an integer from 1 to 100, with the proviso that when M is hydrogen or alkali metal, *n* is at least 2;

the weight ratio of said activating agent to said inorganic peroxide being in the range of 1:9 to 9:1;

the balance of said composition is water-soluble anionic surfactant, or water-soluble nonionic surfactant, or water-soluble neutral inorganic detergent builder salt, or water-soluble alkaline inorganic detergent builder salt, or mixtures thereof.

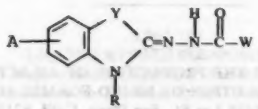
3,960,744
POWDER DETERGENT COMPOSITION

Itomi Homma, Funabashi; Junryo Mino, Kamagaya, and Kenzo Kunikawa, Wakayama, all of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Nov. 27, 1974, Ser. No. 527,878
Claims priority, application Japan, Nov. 29, 1973, 48-134511
Int. Cl.² C11D *7/54*
U.S. Cl. 252—102 **6 Claims**

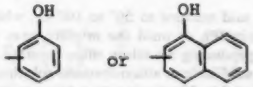
1. A powder detergent composition for washing fabrics consisting essentially of

a. from 0.001 to 0.5 percent by weight, based on the total weight of the detergent composition, of at least one bluing dye precursor having the formula



wherein A is hydrogen, chlorine, $-CH_3$, $-OCH_3$, $-SO_3H$ or $-SO_3Na$; Y is -S-, -O-,

or -C=C-; R is methyl or ethyl; and W is



and

b. the balance is water-soluble clothes-washing organic surfactant and water-soluble detergent builders.

3,960,745
CLEANSING COMPOSITIONS

Michael Royston Billany; Arthur Raymond Longworth, and John Shatwell, all of Macclesfield, England, assignors to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 253,102, May 15, 1972, Pat. No. 3,855,140. This application Oct. 4, 1974, Ser. No. 512,483
Claims priority, application United Kingdom, June 18, 1971, 28764/71
The portion of the term of this patent subsequent to Dec. 17, 1991, has been disclaimed.
Int. Cl.² C11D 3/48, 1/72
U.S. Cl. 252—106 4 Claims

1. A skin cleansing composition consisting essentially of from 0.5 to 10.0% w/v of a salt of chlorhexidine which is soluble to the extent of at least 0.5% w/v in water at ambient temperature, selected from the group consisting of the gluconate, isethionate, formate, acetate, glutamate, succinamate, mono-diglycollate, dimethanesulphonate, lactate, diisobutyrate and glucoheptonate salts, between 10 and 30% of a polyoxyethylene-polyoxypropylene block copolymer of the formula:

$$HO-(CH_2CH_2O)_a(\underset{CH_3}{CH}CH_2O)_b(CH_2CH_2O)_cH$$

wherein *a*, *b* and *c* are integers, such that said copolymer consists of 40 to 70% of polyoxyethylene and wherein the molecular weight of the polyoxypropylene content is between 2000 and 2500, and water.

3,960,746
AZEOTROPE-LIKE COMPOSITIONS OF METHANOL, NITROMETHANE AND TRICHLOROTRIFLUOROETHANE

Robert Alexander Gorski, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed July 25, 1974, Ser. No. 491,684
Int. Cl.² C11D 7/50
U.S. Cl. 252—171 2 Claims

1. An azeotrope-like composition consisting essentially of from 5.0 to 6.3 weight percent of methanol, from 0.05 to 0.6 weight percent of nitromethane and from 93.1 to 94.95 weight percent of 1,1,2-trichloro-1,2,2-trifluoroethane.

3,960,747
PROCESS FOR THE PRODUCTION OF AN ACIDIC AQUEOUS SOLUTION OF SILICO-FORMIC ACID

David H. Blount, 5450 Lea St., San Diego, Calif. 92105

Filed June 10, 1974, Ser. No. 477,861
Int. Cl.² C01B 33/12, 33/18, 33/00
U.S. Cl. 252—182 5 Claims

1. The process for preparing an acidic solution of silico-formic acid by the following steps:

a. Mixing 1 mol of silico-formic acid and from 0.4 to 1 mol of sodium hydroxide;
b. Adding an amount of water to said mixture to produce a 1 to 10 percent solution by weight of sodium silico-formate;
c. Heating said mixture to 50° to 100°C., while stirring for 1 to 3 minutes, or until the mixture goes into solution, thereby producing a sodium silico-formate solution;
d. Adding said sodium silico-formate solution slowly, over a period of 5 to 20 minutes, to a dilute acid solution until the pH is 4.5, while stirring to keep the temperature between 30° and 75°C., thereby producing an acidic solution of silico-formic acid.

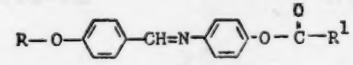
3,960,748
NEMATIC LIQUID CRYSTAL COMPOSITIONS

Bruce H. Klanderman, and Richard T. Klingbiel, Rochester, both of, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 300,007, Oct. 24, 1972, abandoned. This application Nov. 12, 1973, Ser. No. 415,197
The portion of the term of this patent subsequent to Mar. 18, 1992, has been disclaimed.
Int. Cl.² C09K 3/34; G02F 1/13
U.S. Cl. 252—299 7 Claims

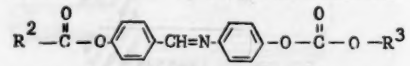
1. In a nematic liquid crystal composition having a resistivity of about 1×10^9 to 1×10^{10} ohm-cm, the improvement wherein said composition comprises predominantly by weight a mixture resulting from the transiminization reaction between at least one Schiff base of the formula:

I.



and at least one Schiff base of the formula:

II.

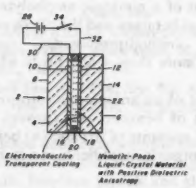


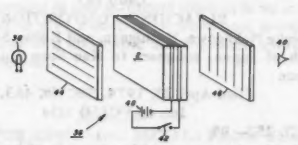
wherein R, R^1, R^2 and R^3 are alkyl radicals having 1 to 18 carbon atoms.

3,960,749
LIQUID-CRYSTAL MIXTURES FOR USE IN LIQUID-CRYSTAL DISPLAYS

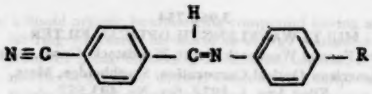
James L. Fergason, Kent, Ohio, assignor to International Liquid Xtal Company, Cleveland, Ohio

Division of Ser. No. 113,948, Feb. 9, 1971, abandoned. This application Jan. 23, 1974, Ser. No. 435,668
Int. Cl.² C09K 3/34; G02F 1/13, 1/16, 1/18
U.S. Cl. 252—299 2 Claims


Electroconductive Transparent Coating
Nematic-Phase Liquid-Crystal Material with Positive Dielectric Anisotropy



1. A nematic liquid crystal composition, for use in a liquid-crystal display of the type in which a layer of liquid-crystal material of positive dielectric anisotropy is sandwiched between transparent conductive electrodes, which comprises a mixture of 20 to 80 parts by weight of bis (4-n-octyloxybenzal)-2-chlorophenylenediamine and 20 to 80 parts by weight of p-methyl-p′-n-butylaniline, said compounds comprising 60 to 97 weight percent of the total composition, and 3 to 40 weight percent of an agent for imparting positive dielectric anisotropy having the formula:



where R is a saturated aliphatic radical containing 1 to 12 carbon atoms.

3,960,750

ELECTRO-OPTICAL DISPLAY

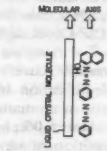
Akio Moriyama, Katano; Masakazu Fukai, Nishinomiya, and Komei Asai, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

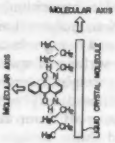
Filed Apr. 15, 1974, Ser. No. 460,876

Claims priority, application Japan, Apr. 16, 1973, 48-43418

Int. Cl.² G02F 1/16; C09K 3/34; G02F 1/13

U.S. Cl. 252—299 **6 Claims**





1. An electro-optical display containg a color switching liquid crystal composition comprising:

a nematic liquid crystal mixture with net positive dielectric anisotropy which is formed of a nematic liquid crystal material with positive dielectric anisotropy and a nematic liquid crystal material with negative dielectric anisotropy and exhibits in the absence of an electric field a homogeneous or twisted type arrangement

and at least two kinds of dyes different in light absorption, at least one of said dyes being a pleochroic dye and at least two of said dyes having mutually different display performance characteristics with respect to the application of an electric field with a means for applying an electric field to said liquid crystal composition.

3,960,751

ELECTRO-OPTICAL DISPLAY ELEMENT

Akio Moriyama, Katano; Masakazu Fukai, Nishinomiya; Hiroshi Tatsuta, Katano, and Hiroaki Takahashi, Moriguchi, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

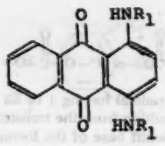
Filed Sept. 16, 1974, Ser. No. 506,056

Claims priority, application Japan, Sept. 19, 1973, 48-106310; Oct. 31, 1973, 48-123161

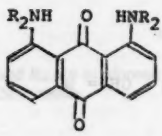
Int. Cl.² G02F 1/16; C09K 3/34; G02F 1/13

U.S. Cl. 252—299 **8 Claims**

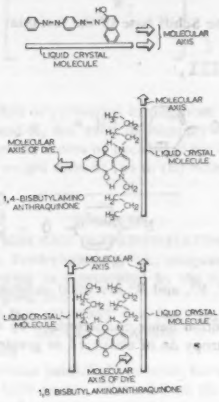
7. An electro-optical display device comprising two parallel transparent members whose inner surfaces have been coated with transparent electrodes; an electro-optical element comprising a nematic liquid crystal composition and at least one compound represented by the formula



or



wherein R_1 is an n-alkyl radical having from 5 to 20 carbon atoms and R_2 is an n-alkyl radical having from 4 to 20 carbon atoms, said electro-optical element being interposed between said electrodes and having all its molecules in their quiescent



state, nonelectrically aligned perpendicular or parallel to such facing surfaces, and means for selectively applying an electric field across said electro-optical element through said electrodes to exceed a threshold electric field.

3,960,752

LIQUID CRYSTAL COMPOSITIONS

Bruce H. Klanderman, and David P. Maier, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

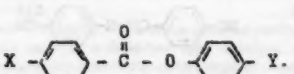
Continuation-in-part of Ser. No. 300,008, Oct. 24, 1972, abandoned. This application Nov. 12, 1973, Ser. No. 415,196

Int. Cl.² C09K 3/34; G02F 1/03, 1/13, 1/16

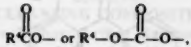
U.S. Cl. 252—299 **10 Claims**

1. A nematic liquid crystal composition comprising a mixture of:

I. Compound I,



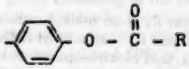
wherein one of X and Y is a strong electronegative group and the other of X and Y is R^4, R^4O-,



R^4 being an alkyl radical having 1 to 18 carbon atoms; with

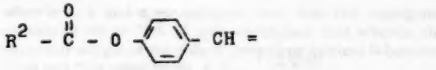
II. a mixture resulting from the transiminization reaction of at least one Schiff base of the formula

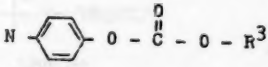
Compound II,



with at least one Schiff base of the formula:

Compound III,





wherein R, R^1, R^2, and R^3 are alkyl radicals having 1 to 18 carbon atoms,

said composition being characterized by a positive dielectric anisotropy $\Delta\epsilon$ of about +1 or greater.

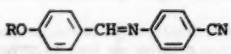
3,960,753

FLUORESCENT LIQUID CRYSTALS

Robert Dean Larrabee, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed May 30, 1974, Ser. No. 474,600
Int. Cl.² C09K 3/34; C02F 1/16
U.S. Cl. 252—299 5 Claims

1. A composition which exhibits fluorescent intensity variations at its solid to mesomorphic or mesomorphic to isotropic phase transition comprising a solution of one or a mixture of liquid crystal compounds of the formula



wherein R is C_nH_{2n+1}— or $C_nH_{2n+1}CO$— and n is an integer from 1–10 and an amount of 2, 4, 6-trimethylpyridinium tetrakis [1, 1, 1-trifluoro-4-(p-trifluoromethylphenyl)-2, 4-butenedioxo] europium III effective to induce said variations.

3,960,754

MULTI-WAVELENGTH OPTICAL FILTER

Richard Forrest Woodcock, South Woodstock, Conn., assignor to American Optical Corporation, Southbridge, Mass.

Filed Aug. 1, 1974, Ser. No. 493,587
Int. Cl.² G02B 5/22
U.S. Cl. 252—300 5 Claims

1. A multi-wavelength optical filter for protection against laser radiation comprising at least one base glass composition, all percentages on an oxide basis, containing from 0.1–5 weight percent of a compound producing Ce^{3+} ions, 25–75 weight percent of a compound producing Er^{3+} ions and 0.5–10 weight percent of a compound producing Cu^{2+} ions, said compounds being soluble in at least a melt of a base glass composition so as to be uniformly distributed throughout the base composition.

3,960,755

DETECTING COMPOSITIONS AND METHOD OF USING SAME

Michael Thomas Beachem, Somerset, and Mary Ellen Nichols, Highland Park, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed May 8, 1967, Ser. No. 638,697
Int. Cl.² C09K 11/00
U.S. Cl. 252—301.16 4 Claims

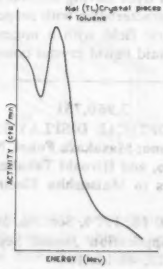
1. A slightly wood permeable, covert composition of matter for the marking and identification of wooden water craft comprising (A) an aliphatic or aromatic hydrocarbon solvent, (B) from about 0.1% to about 5.0%, by weight, based on the total weight of said composition, of a hydroxyphenyl benzothiazole, (C) from about 5% to about 60%, by weight, based on the total weight of said composition, of a water-insoluble, odorless, tacky, amorphous polyurethane resin having a density less than about 1.0 and being substantially colorless when spread as a film on the surface of water and (D) from about 0.1% to about 5.0%, by weight, based on the total weight of said composition, of sodium dioctyl sulfosuccinate, said composition having a viscosity of from about 5 to about 2000 seconds in a No. 4 Ford Cup.

3,960,756

HIGH EFFICIENCY SCINTILLATION DETECTORS

John E. Noakes, Athens, Ga., assignor to Bicron Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 257,755, May 30, 1972, abandoned. This application Aug. 16, 1974, Ser. No. 497,915
Int. Cl.² C09K 11/12; G01T 1/20
U.S. Cl. 252—301.18 8 Claims



1. A high efficiency scintillation detector composition especially suitable for use as an integral component of a scintillation counter consisting essentially of the combination of

a. a multiplicity of crystal pieces of an alkali metal halide activated with thallium, and

b. a liquid organic benzene-ring compound having molecular ring structures favorable to energy transfer selected from the group consisting of benzene, toluene, o-xylene, m-xylene, p-xylene, phenyl cyclohexane, ethyl benzene, triethylbenzene, n-butylbenzene, anisole, mesitylene, p-cymene, and dimethoxybenzene,

the crystal pieces of (a) being broken or whole crystals in the size range of from a millimeter to over an inch in their longest dimensions and being indiscriminately incorporated in said organic compound, the quantity of said crystals being at least fifty percent by volume of the whole, and the quantity of organic compound being less than fifty percent by volume of the whole being sufficient to cover the inorganic crystal pieces so as to effect an energy transfer interaction between the organic molecules and the crystal pieces whereby incident radiation is resolved into a single composite spectrum in proportion to the amount and intensity of incident radiation energy impinging thereupon.

3,960,757

PROCESS FOR ENCAPSULATION OF MEDICAMENTS

Masataka Morishita; Yoshihito Inaba; Mitsuru Fukushima; Yoshinori Hattori; Sadami Kobari, and Tetsuo Matsuda, all of Shizuoka, Japan, assignors to Toyo Jozo Co., Ltd., Japan

Filed June 29, 1973, Ser. No. 375,027

Int. Cl.² B01J *13/02*

U.S. Cl. 252—316 **16 Claims**

1. A process for preparing encapsulated medicines, characterized by dissolving a gastric-soluble, enteric soluble or semi-permeable hydrophobic wall material in at least one organic solvent immiscible with water which has a boiling point of not more than 100°C., a vapor pressure higher than that of water and a dielectric constant of not more than 10, dissolving or dispersing in the resulting solution a water-insoluble or slightly water-soluble medicament, dispersing the resulting solution or dispersion to the form of fine drops into a vehicle consisting of a hydrophilic colloid or a surface active agent in water, and then evaporating the organic solvent.

3,960,758

NON-DISCOLORING STABILIZERS

Josef Witte, Cologne; Dieter Theisen, Remscheid; Ernst Roos, Cologne, and Karl Nützel, Opladen, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

Filed June 28, 1974, Ser. No. 484,115

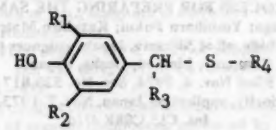
Claims priority, application Germany, July 5, 1973, 2334163

Int. Cl.² C08K *15/08*

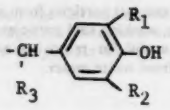
U.S. Cl. 252—404 **3 Claims**

1. A stabilizer consisting essentially of a mixture of

a. a compound of the formula

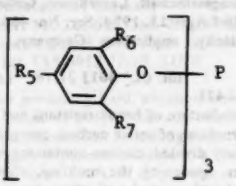


wherein R_1 and R_2 each individually are alkyl having 1 to 8 carbon atoms, aralkyl having 7 to 9 carbon atoms or cycloalkyl having from 5 to 7 carbon atoms; R_3 is hydrogen, alkyl having 1 to 8 carbon atoms, cyclohexyl, cyclohexenyl or methylcyclohexenyl and R_4 is alkyl having 1 to 8 carbon atoms or



wherein R_1, R_2, and R_3 are as aforesaid and

b. compound of the formula



wherein R_5 is alkyl or cycloalkyl having from 5 to 10 carbon atoms and R_6 and R_7 are each individually hydrogen, alkyl having 1 to 7 carbon atoms or cycloalkyl having up to 7 carbon atoms, the weight ratio of (a) to (b) being 4:1 to 1:4.

3,960,759

LIQUID VESICANT DIFFERENTIATING PAINT

James N. Mallis, Fredericksburg, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 24, 1965, Ser. No. 510,166

Int. Cl.² C09K *3/00*

U.S. Cl. 252—408 **4 Claims**

1. A liquid vesicant paint, light in color, for use in detecting the presence of toxic agents, selected from the group consisting of mustard and nerve gases, in the air or on vehicle surfaces, which paint when in use reacts to the presence of said agents by displaying a particular color which is a definitely observable reaction distinct to at least one or more of the different ones of said agents, said paint containing essentially:

a mixture of a latex base, two dyestuffs present in formulation at concentration of approximately 1% each, by weight, celite, titanium dioxide and water, wherein;

said dyestuff materials are 2, 5, 2', 5'-tetramethyl triphenylmethane-4, 4'-diazo-bis-B-hydroxynaphthoic anilide; and, ethyl-bis-(2, 4-dinitrophenyl)-acetate.

3,960,760

SEWER WASTE WATER TREATING AGENT PRODUCED FROM WASTE CRACKING CATALYST

Seiji Sanga, Toyonaka, and Yoichi Nishimura, Komae, both of Japan, assignors to Catalysts and Chemicals Industries Co., Ltd., Tokyo, Japan

Filed June 28, 1974, Ser. No. 483,922

Claims priority, application Japan, Nov. 2, 1973, 48-122895

Int. Cl.² B01J *29/06*

U.S. Cl. 252—412 **2 Claims**

1. A method of treating waste silica-alumina catalyst particles previously used in a fluid-bed type catalytic cracking process, which consists essentially of the steps of: soaking said waste catalyst particles in an aqueous sodium hydroxide solution having a concentration of from 0.2N to 5N, at a temperature in the range of 70° to 105°C, for from 2 to 48 hours, employing a ratio of from 50 to 100 ml of said aqueous sodium hydroxide solution per 10 grams of said waste catalyst parti-

cles; removing the catalyst particles from said aqueous sodium hydroxide solution, washing said particles and drying them to obtain a powder useful for removing ammonium ions and heavy metal ions from waste water.

3,960,761

PRODUCTION OF STRONG ACTIVE CARBON MOLDINGS

Alex Bürger, Cologne; Hermann Kaiser, Leverkusen, and Werner Ludovici, Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Apr. 23, 1974, Ser. No. 463,641

Claims priority, application Germany, May 5, 1973, 2322706

Int. Cl.² B01J *21/18*

U.S. Cl. 252—421 **5 Claims**

1. In the production of break-resistant and abrasion-resistant shaped structures of active carbon, comprising the steps of molding a finely divided, carbon-containing starting material with a binder, hardening the molding, eliminating volatile constituents therefrom and activating the molding at a temperature of about 700° to 1200°C with at least one of steam and carbon dioxide, the improvement which comprises molding a carbon-containing material selected from the group consisting of mineral coal, brown coal coke, charcoal, coconut shell coke, peat coke, petroleum coke, acid-sludge coke, a coke-like residue from the thermal decomposition of a synthetic resin and mixtures of these substances, with a binder comprising a mixture of a phenol and an aldehyde or a water soluble pre-condensed resin thereof, the phenol being at least one member selected from the group consisting of phenol, cresol, xylenol and naphthol, and the aldehyde being at least one member selected from the group consisting of formaldehyde, metaldehyde, paraldehyde, acetaldehyde and benzaldehyde, the moldings being stored for about 1 to 24 hours prior to hardening.

3,960,762

PRODUCTION OF ABSORBENTS

Reinhard Kroebel, Kaarst, and Alfred Meyer, Cologne, both of Germany, assignors to Bayer Aktiengesellschaft, Germany

Continuation of Ser. No. 314,754, Dec. 13, 1972, abandoned. This application Aug. 9, 1974, Ser. No. 496,107

Claims priority, application Germany, Dec. 18, 1971, 2162951

Int. Cl.² B01D *15/08*

U.S. Cl. 252—426 **33 Claims**

1. A process for the production of an absorbent based on a synthetic resin which comprises (1) adding an extractant, a mixture of extractants or a solution of an extractant in a solution promoter to a mixture comprising a monomeric monovinyl compound and a monomeric polyvinyl compound, (2) polymerizing the resulting mixture in the presence of a free radical catalyst; the extractant, the mixture of extractants and the solution of the extractant in the solution promoter being solvents for the monomeric monovinyl or polyvinyl compound but not for the resulting polymer, and (3) recovering a copolymer in which the extractant or extractant mixture is included in the polymer, said extractant, mixture of extractants or the solution of the extractant in the solution promoter being used in a quantity of from 10 to 90% by weight, based on the total quantity of absorbent and said polyvinyl compound being employed in a quantity of from 5 to 70% by weight, based on the total quantity of monomers.

3,960,763

AGRICULTURAL FOAMS AS CARRIERS FOR ACTIVATED CHARCOAL

Madeline G. Lambou; James J. Spadaro, both of New Orleans, and Eunice M. Rusch, Metairie, all of La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed July 17, 1974, Ser. No. 489,797

Int. Cl.² B01J *31/02*

U.S. Cl. 252—428 **6 Claims**

1. An aqueous foam-precursor composition containing:
   a. about from 1% to 6% by weight of activated charcoal,
   b. about 2% by weight of a spumific material selected from the group consisting of:
      proteinaceous-carbohydrate whey solids,
      proteinaceous animal hide glue, and
      a mixture of the whey solids and the animal hide glue,
   c. not more than about 0.1% by weight of a viscosity builder polysaccharide of about 1,000,000 molecular weight, and
   d. about from 1% to 2% by weight of a surfactant mixture consisting of equal parts of dodecyl ether of polyethylene glycol and an ammonium alkyl sulfate in which the carbon chain ranges from C_{12} to C_{18}, said surfactant mixture used in an amount equivalent to 0.5% of the weight with respect to said activated charcoal, and
   d. sufficient water to make 100% by weight.

3,960,764

CATALYTIC COMPOSITION FOR THE CONVERSION OF HYDROCARBONS

Jean René Bernard, St-Symphorien D'ozon; Daniel Elie Brunel, Montpellier; Auguste André Commeyras, Clapiers; Camille Michel Coste, Amelie-les-Bains; Jean Joseph Itier, Montpellier, and Hubert Wilhelm Knoche, Meyzieu, all of France, assignors to Entreprise de Recherches et d'Activites Petrolieres Elf, Paris, France

Filed Sept. 26, 1974, Ser. No. 509,608

Claims priority, application France, Sept. 26, 1973, 73.34561

Int. Cl.² B01J *31/12*

U.S. Cl. 252—429 R **6 Claims**

1. A catalytic composition for the conversion of hydrocarbons under conditions suited to the desired conversion, wherein said composition is constituted by a mixture of Lewis acid corresponding to the formula M X m in which:
   M is an atom of a metal belonging to Groups IV, V and VI of the Periodic Table of Elements,
   X is a halogen
   m is within the range of 3 to 6
   and a sulphonic acid corresponding to the general formula $RF(SO_3H)_p$ where RF represents a perfluorinated alkyl or cycloalkyl hydrocarbon radical having a number of carbon atoms ranging from 2 to 8 and *p* is 1 or 2.

3,960,765

CATALYST FOR POLYMERIZATION OF OLEFINS AND PROCESS FOR PREPARING THE SAME

Akinobu Shiga; Yoshiharu Fukui; Kazuhiro Matsumura, and Satoru Uchida, all of Niihama, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Nov. 4, 1974, Ser. No. 520,817

Claims priority, application Japan, Nov. 2, 1973, 48-123781

Int. Cl.² C08F *4/16*

U.S. Cl. 252—429 B **9 Claims**

1. A process for preparing a solid catalyst for the polymerization of olefins which comprises the steps of (1) reducing titanium tetrachloride with an organoaluminum compound represented by the formula

$$R_nAlX_{3-n} \quad (I)$$

wherein R represents a straight chain or branched chain alkyl group having 1 to 18 carbon atoms, an alicyclic hydrocarbon

group or an aromatic hydrocarbon group, X represents a halogen atom, and n is a value of from 1 to 3, inclusive, (2) reacting the resulting β - type titanium trichloride with a complexing agent, (3) reacting the solid catalyst thus obtained with an organoaluminum compound represented by the formula

$$R'_nAlX_{3-n} \quad (II)$$

wherein R' represents a straight chain or branched chain alkyl group having 1 to 18 carbon atoms, an alicyclic hydrocarbon group or an aromatic hydrocarbon group, X represents a halogen atom, and m is a value of $0<m<1.5$, and (4) reacting the resulting solid catalyst with a complexing agent wherein said complexing agent is selected from the group consisting of N,N-dimethylformamide, N,N-dimethylacetamide, N,N-dimethylpropionamide, N,N,N',N'-tetramethylurea, diethyl ether, di-n-propyl ether, diisopropyl ether, di-n-butyl ether, diisobutyl ether, di-tert-butyl ether, di-n-amyl ether, diisoamyl ether, dineopentyl ether, di-n-hexyl ether, di-n-octyl ether, diphenyl ether, di-o-tolyl ether, di-p-tolyl ether, dicyclohexyl ether, diethyl sulfide, di-n-propyl sulfide, di-n-butyl sulfide, di-tert-butyl sulfide, diphenyl sulfide, trimethylamine, triethylamine, tri-n-butylamine, triphenylamine, pyridine, quinoline, symtriazine, N,N-dimethylaniline, N,N-diethylaniline and ',N'-tetramethylethylenediamine.

3,960,766
CATALYST FOR THE PRODUCTION OF PYRIDINE AND 3-METHYLPYRIDINE

Helmut Beschke; Hans Schaefer; Gerd Schreyer, all of Grossauheim; Wilhelm Alfons Schuler, Bad Homburg, and Wolfgang Weigert, Offenbach, all of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Germany

Filed May 17, 1973, Ser. No. 361,331

Claims priority, application Germany, May 18, 1972, 2224160

Int. Cl.² B01J *27/06*

U.S. Cl. 252—437 **19 Claims**

1. A catalyst suitable for the reaction of acrolein with ammonia to form pyridine and 3-methylpyridine consisting essentially of the product obtained by treating with oxygen at a temperature of 550° to 1200°C. compounds of the elements Al, F and O and at least two other elements selected from the second, fourth, fifth and sixth groups of the periodic system, said two other elements being selected from the group consisting of Mg, Ba, Zr, Sn, Ti, P, Ta, Sb and S, the ratios of the elements being Al to F of between 1,000 to 10 and 1,000 to 800 and of Al to the elements of the second, fourth, fifth and sixth groups being between 1,000 to 5 and 1,000 to 200.

3,960,767
MODIFIED ZINC FERRITE OXIDATIVE DEHYDROGENATION CATALYSTS

Harold F. Christmann, Seabrook, and Edward J. Miklas, Conroe, both of Tex., assignors to Petro-Tex Chemical Corporation, Houston, Tex.

Filed Sept. 3, 1974, Ser. No. 502,305

Int. Cl.² B01J *27/18;* **C07C** *5/48*

U.S. Cl. 252—437 **2 Claims**

1. A novel catalyst composition suitable for oxidative dehydrogenation of organic compounds produced by the process consisting essentially of mixing a powder of a preformed zinc ferrite composition having the empirical formula

$$Zn_xFe_yO_z$$

wherein x is from about 0.1 to about 2, y is from about 0.3 to about 12 and z is from about 3 to about 18 wherein the ratio of y to x is from about 2:1 to 5:1 with powdered zinc carbonate as a promoter in an amount of from about 0.1 to about 25 wt. % determined on the basis of zinc oxide and based on the weight of the preformed zinc ferrite composition and aqueous phosphoric acid, said aqueous phosphoric acid being added in an amount to dampen the powder mixture of zinc ferrite and zinc carbonate.

3,960,768
PRODUCTION OF CARBON BY ELIMINATING HYDROGEN HALIDE FROM POLYMERIZED HALOHYDROCARBONS

Willi Ripperger; Willi Oettinger, both of Ludwigshafen; Rudolf Kaiser, Bad Durkheim; Klaus Pfitzner, and Richard Adolf Palm, both of Ludwigshafen, all of Germany, assignors to Sirmac Ltd., Dusseldorfer, Germany

Continuation of Ser. No. 221,658, Jan. 28, 1972, abandoned. This application July 5, 1974, Ser. No. 486,059

Int. Cl.² B01J *21/18, 31/10*

U.S. Cl. 252—444 **6 Claims**

1. A process for producing hard, abrasion-resistant spherical carbon from beads of polyvinylidene chloride produced directly by bead polymerization consisting essentially of heating said beads of polyvinylidene chloride to a temperature of from about 140° to about 250°C in a first stage under flowing nitrogen for from about 1 hour to about 10 hours whereby from 30 to 45% of the hydrogen chloride that is capable of being removed is eliminated and thereafter raising the treatment temperature very slowly from about 250° to about 350°C in the transition stage between the first and a second stage, and further heating said beads in said second stage to a temperature within the range of about 600° to about 950°C in the presence of an inert or reducing gas, wherein carbon-containing compounds selected from the group consisting of methane, homologs of methane, acetylene, benzene and carbon tetrachloride are mixed with the inert or reducing gas of said second stage in concentrations of from about 0.05 to about 20% by volume to decompose and deposit pyrocarbon on the surface and in the pores of said beads, said heating being continued until the residual chlorine content of the beads has been reduced to less than 250 ppm, said beads undergoing linear shrinkage during said heating stages of up to 50%.

3,960,769
CARBON-CONTAINING MOLECULAR SIEVES

Heinrich Munzner, Essen-Kray; Heinrich Heimbach, Bochum; Werner Korbacher, Essen-Borbeck; Werner Peters, Wattenscheid; Harald Juntgen, Essen-Heisingen; Karl Knoblauch, Essen, and Dieter Zundorf, Essen-Heisingen, all of Germany, assignors to Bergwerksverband GmbH, Essen, Germany

Division of Ser. No. 161,211, July 9, 1971, Pat. No. 3,801,513. This application Feb. 21, 1974, Ser. No. 444,382

Claims priority, application Germany, Apr. 23, 1971, 2119829

The portion of the term of this patent subsequent to Apr. 2, 1991, has been disclaimed.

Int. Cl.² C01B *13/00*

U.S. Cl. 252—444 **7 Claims**

1. A molecular sieve which adsorbs a gas of a first atomic or molecular size more readily than a gas of a larger second atomic or molecular size, said molecular sieve comprising coke having carbon deposited in the pores to reduce the pore size to an effective size less than about 0.3 millimicrons, and said molecular sieve being capable of adsorbing oxygen so much more readily than nitrogen that when air is passed through a confining space, having a volume of substantially 1 liter and substantially filled with said molecular sieve, for a period of about 1 minute and at a velocity of about 30 centimeters per second, subsequent desorption of the thus-adsorbed gas from said molecular sieve yields a gas containing a minimum of about 35 volume percent of oxygen.

3,960,770

PROCESS FOR PREPARING MACROPOROUS OPEN-CELL CARBON FOAM FROM NORMALLY CRYSTALLINE VINYLIDENE CHLORIDE POLYMER

Charles F. Raley, Jr., and Delman R. Asher, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 385,493, Aug. 3, 1973, abandoned, which is a continuation of Ser. No. 179,194, Sept. 7, 1971, abandoned. This application July 25, 1974, Ser. No. 491,894

Int. Cl.² B01J 21/18, 31/10

U.S. Cl. 252—444 4 Claims

1. A process for preparing substantially open-cell, macroporous foamed activated carbon said process consisting essentially of (1) contacting, at a temperature of about 25°C. to about 100°C., a normally crystalline vinylidene chloride polymer in substantially open-cell, macroporous foam form with ammonia in liquid form as the sole reactant until at least about 50 percent of theoretical Cl^- is removed, then (2) water extracting the reaction product of step (1) to recover a foamed activated carbon, and (3) heating said foamed activated carbon to a temperature up to about 350°C. sufficient to remove residual ammonium chloride.

4. A substantially open-cell activated carbon foam wherein the average cell diameter is at least about 0.01 millimeter, said carbon foam being prepared by the process of Claim 1.

3,960,771

COMPOSITE ADSORBENT

Hiroshi Tanaka; Takuo Tanaka, and Takeshi Tanaka, all of Nagahama, Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan

Filed Apr. 17, 1974, Ser. No. 461,484

Claims priority, application Japan, Apr. 20, 1973, 48-45508

Int. Cl.² B01J 21/18

U.S. Cl. 252—446 4 Claims

1. A composite adsorbent for the adsorption of gases comprising particles of activated clay and fine powder of active carbon randomly adhered to the surface of said particles, said particles of activated clay having a particle size of 70μ–150μ and said powder having a size of 10μ–40μ, the pore size of the activated clay being greater than the pore size of the active carbon.

3,960,772

AGGLOMERATED ALUMINA-BASED SPHERICAL GRAINS

Jean-Paul Fort, Antony, and Max Michel, Yerres, both of France, assignors to Rhone-Progil, Courbevoie, France

Filed Mar. 27, 1974, Ser. No. 455,233

Claims priority, application France, Mar. 27, 1973, 73.10899

Int. Cl.² B01J 21/04, 29/06

U.S. Cl. 252—455 R 10 Claims

1. A method of producing spherical members of alumina-based grains formed primarily of particles of alumina selected from the group consisting of alumina hydrate and alumina produced by partial dehydration of gels or crystals of alumina hydrates in a stream of hot gases, characterized by moistening said alumina-based particles with water to form a paste of the alumina-based particles, forming said pastes into grains of any shape, introducing said grains into a substantially immiscible liquid, subjecting the liquid to mechanical vibrations while the grains are contained therein whereby the grains form into spherical members, separating the spherical members from the liquid, hydrothermally treating, drying and calcining the spherical members.

3,960,773

CATALYST COMPOSITIONS AND THEIR PREPARATION

Brent J. Bertus; Floyd Farha, Jr., and Harlin D. Johnston, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 327,722, Jan. 29, 1973, abandoned, which is a division of Ser. No. 81,599, Oct. 16, 1970, Pat. No. 3,745,194. This application Nov. 7, 1974, Ser. No. 521,772

Int. Cl.² B01J 23/82, 23/84

U.S. Cl. 252—455 R 17 Claims

1. A catalyst composition consisting of tin, nickel, at least one metal selected from the group consisting of arsenic and antimony and, optionally, at least one metal selected from the group consisting of Group Ia and Group IIa metals, said elements in combination with sufficient oxygen to form one or more neutral compounds, said composition formed by dry mixing a tin compound and a nickel compound in amounts sufficient to provide an atomic ratio of tin to nickel in the finished catalyst in the range of 1:3 to 3:1, said tin and nickel compounds being selected from the group consisting of their respective oxides and salts, a quantity of an antimony compound, an arsenic compound or a combination thereof sufficient to provide from about 0.1 to about 10 weight percent of said antimony or said arsenic based upon the combined weight of said tin and nickel and oxygen combined therewith, said arsenic compound selected from the group consisting of the oxides, salts and acids thereof, said antimony compound selected from the group consisting of the oxides and salts thereof, and, optionally, a quantity of a Group Ia metal salt, a Group IIa metal salt or combination thereof sufficient to provide from about 0.1 to about 10 weight percent of said Group Ia metal or said Group IIa metal based upon the combined weight of said tin and nickel and oxygen combined therewith, and thereafter calcining said composition.

3,960,774

ZEOLITIC ADSORBENT FOR XYLENE SEPARATION

Donald H. Rosback, Elmhurst, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Continuation of Ser. No. 356,666, May 2, 1973, Pat. No. 3,878,127. This application Jan. 24, 1975, Ser. No. 543,845

The portion of the term of this patent subsequent to Apr. 15, 1992, has been disclaimed.

Int. Cl.² B01J 29/06; C07C 7/00

U.S. Cl. 252—455 Z 6 Claims

1. A solid adsorbent produced by the steps of:

a. contacting a precursor mass comprising a X or Y structured zeolite having a Na_2O/Al_2O_3 ratio less than about 0.7 with an aqueous sodium hydroxide solution at first ion-exchange conditions to increase the sodium cations content to a Na_2O/Al_2O_3 ratio of greater than about 0.7;

b. treating the sodium-exchanged mass at second ionexchange conditions to effect the essentially complete exchange of sodium cations; and,

c. drying the resulting exchanged mass at conditions sufficient to reduce the LOI at 900° C. to less than about 10 wt. %.

3,960,775

CATALYST FOR THE PRODUCTION OF ETHYLENE OXIDE

Carlo Piccinini; Morello Morelli, and Pierluigi Rebora, all of San Donato Milanese, Italy, assignors to Snam Progetti S.p.A., San Donato Milanese, Italy

Division of Ser. No. 67,025, Aug. 26, 1970, abandoned. This application Aug. 1, 1973, Ser. No. 384,692

Claims priority, application Italy, Aug. 26, 1969, 21262

Int. Cl.[2] B01J *23/08*

U.S. Cl. 252—463 6 Claims

1. A catalyst for the oxidation of ethylene to ethylene oxide, said catalyst comprising silver, calcium and barium in a gram atomic ratio of 15/2.5/1.

2. The catalyst of claim 1 wherein said catalyst includes a ceramic carrier.

3,960,776

LITHIUM PROMOTED MAGNESIUM CHROMITE DEHYDROGENATION CATALYSTS

Michael C. Ellis, and Harold E. Manning, both of Houston, Tex., assignors to Petro-Tex Chemical Corporation, Houston, Tex.

Filed July 1, 1974, Ser. No. 484,576

Int. Cl.[2] B01J *21/10;* C01C *5/38*

U.S. Cl. 252—465 2 Claims

1. A catalyst for use in cyclic dehydrogenation consisting essentially of magnesium chromite having the general formula $MeCr_2O_4$ wherein Me is Mg or Mg and one or more of the divalent ions of Ca, Sr, Ba, Fe, Mn, Co, Ni, Cu, Zn or Cd, provided that Mg comprises at least 50 atomic percent of said Me ions and from 2 to 8 mol percent of Li based on said magnesium chromite.

3,960,777

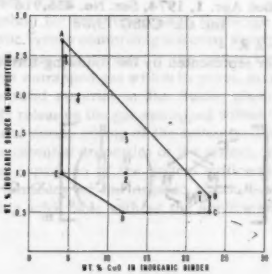
GOLD COMPOSITIONS

Roy Thomas Coyle, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed June 23, 1975, Ser. No. 589,548

Int. Cl.[2] H01B *1/02*

U.S. Cl. 252—514 9 Claims



1. In a composition of finely divided gold particles and finely divided inorganic binder particles dispersed in an inert liquid vehicle, improved compositions of, by weight, 85–92% gold particles, 0.5–2.7% inorganic binder particles, and 7–14% vehicle; the inorganic binder being

a. 4–23% CuO

b. 13–36% CdO or mixtures thereof with CaO, provided that at least 13% of the binder is CdO,

c. 30–60% of one or more of B_2O_3, SiO_2, P_2O_5, V_2O_5, Al_2O_3, and GeO_2, provided that said binder comprises at least 5% of one or more of B_2O_3, SiO_2, P_2O_5, and GeO_2, and

d. 0–20% of one or more of PbO and Bi_2O_3;

said compositions being further characterized in that the weight percentage of CuO in said inorganic binder and the weight percentage of inorganic binder present in the total composition are chosen together from a point which lies within the straight lines connecting points A, B, C, D, and E in the graph of the drawing.

3,960,778

PYROCHLORE-BASED THERMISTORS

Robert Joseph Bouchard, and Donald Burl Rogers, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 15, 1974, Ser. No. 442,904

Int. Cl.[2] H01B *1/06;* H01C *1/06*

U.S. Cl. 252—519 32 Claims

1. Powder compositions useful for making thermistors, said compositions comprising

a. 50–98% of a crystalline powder which is a solid solution of pyrochlore-related oxides, one such oxide being highly conductive and another such oxide being semiconductive, and

b. 2–50% of a glass powder as a binder.

3,960,779

SEMICONDUCTING GLAZE COMPOSITION

Gordon Rosenblatt, Toronto, Canada, assignor to Canadian Porcelain Company Limited, Hamilton, Canada

Filed Apr. 21, 1975, Ser. No. 569,991

Int. Cl.[2] H01B *1/08*

U.S. Cl. 252—521 13 Claims

1. In a semiconducting glaze composition for use on electrical insulators containing a base glaze and a semiconducting phase, the improvement which comprises employing as the semiconducting phase, a mixture of an alkali metal or alkaline earth metal stannate and an antimony oxide, the stannate being about 60–95% by weight of the semiconducting phase and the remainder of said phase being antimony oxide, said semi-conducting phase being about 3.5–20% of the total weight of dry solids in the semi-conducting phase and the base glaze, the glaze when fired exhibiting a surface resistivity of about 10–200 MΩ/square and a low temperature coefficient of resistivity.

3,960,780

NON-CAKING ALKYL ETHER SULFATE-CONTAINING DETERGENT COMPOSITION

Moriyasu Murata, Chiba; Makoto Yamanaka, Koganei, and Fumio Sai, Funabashi, all of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

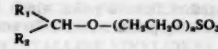
Filed Oct. 31, 1975, Ser. No. 627,701

Claims priority, application Japan, Oct. 31, 1974, 49-125810

Int. Cl.[2] C11D *1/14, 17/06*

U.S. Cl. 252—532 5 Claims

1. A granular or powdery detergent composition consisting essentially of from 3 to 25 percent by weight of an ether sulfate surfactant selected from the group consisting of compounds having the formulae



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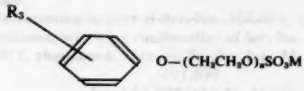


and mixtures thereof,
wherein
R_1 and R_2, which are the same or different, are hydrogen, alkyl having one to 21 carbon atoms, or alkenyl having one to 21 carbon atoms, provided that the sum of the number of carbon atoms of R_1 plus R_2 is 11 to 21, R_3 is alkyl having 8 to 16 carbon atoms,
n is a number from 1 to 10, and
M is an alkali metal or an alkaline earth metal,
from 10 to 100 percent by weight, based on the weight of said ether sulfate surfactant, of polyethylene glycol having a molecular weight of 2,000 to 50,000,
and the balance is water-soluble, synthetic anionic clothes-washing surfactant, different from said ether sulfate, or water-soluble, synthetic nonionic clothes washing surfactant, or water-soluble alkaline inorganic builder salt, or water-soluble organic builder, or water-soluble neutral salt, or mixtures thereof,
said detergent composition having been prepared by mixing the above-named components thereof with water to form a uniform slurry, and then removing water from the slurry to obtain the powdery detergent composition having the polyethylene glycol uniformly distributed on the detergent particles.

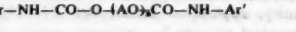
3,960,781

ISOCYANATE-CAPPED SURFACE ACTIVE COMPOSITIONS AND METHODS OF USING THEM

Richard E. Freis, Minneapolis, and Larry M. Rue, Inver Grove Heights, both of Minn., assignors to Economic Laboratories, Inc., St. Paul, Minn.

Division of Ser. No. 350,004, April 11, 1973, Pat. No. 3,899,387. This application May 12, 1975, Ser. No. 576,348
Int. Cl.² B01F *17/16*; C11D *3/33*, *1/72*
U.S. Cl. 252—541 **7 Claims**

1. A rinse additive composition comprising a diaryl urethane blended with a solid wax or a poly(oxyalkylene)-containing wetting agent, said diaryl urethane having the following structural formula:



wherein
Ar and Ar′ are monovalent aryl groups free of —NCO radicals,
A is an alkylene group containing 2–4 carbon atoms, at least some of said alkylene groups containing 2 carbon atoms, and n is a number greater than 3 selected such that the divaient radical $-(AO)_n-$ has a molecular weight less than 12,000.

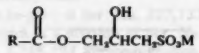
3,960,782

SHAMPOO COMPOSITIONS WHICH IMPART HIGH LUSTER AND MANAGEABILITY TO HAIR

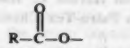
Edwin W. Daley, Cincinnati, and M. Pauline Yowler, Springfield Township, Hamilton County, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Sept. 27, 1974, Ser. No. 509,995
Int. Cl.² C11D *1/30*, *3/26*
U.S. Cl. 252—544 **6 Claims**

1. A shampoo composition comprising:
A. from about 8 to about 22 percent of a surfactant selected from the group consisting of
1. water-soluble salts of a fatty acid monoglyceride sulfonate of the formula



wherein



is a fatty acid moiety containing from about 8 to 22 carbon atoms and wherein M is a salt-forming cation; and
2. water-soluble salts of an alkyl sulfate wherein the alkyl group contains from about 8 to about 22 carbon atoms;
B. from about 2 to about 15 percent urea;
C. from about 1 to about 10 percent of guanidine or a water-soluble salt thereof; and
D. from about 0.2 to about 2.0 percent of dodecyl alcohol;
said composition having a pH of from about 5 to about 8.

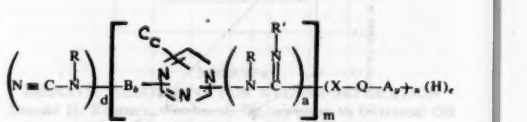
3,960,783

NOVEL POLYMERS FROM S-TRIAZINE CYANAMIDE COMPOUNDS

Raymond Seltzer, New City, and Paul D. Sherman, Shrub Oak, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Apr. 1, 1974, Ser. No. 456,916
Int. Cl.² C08G *73/06*
U.S. Cl. 260—2 R **37 Claims**

1. A polymer represented by the following formula



wherein
y = 0, 1, 2, 3 or 4
a = 1, 2 or 3
b = 0, 1 or 2
c = 0, 1 or 2
a+b+c = 3
m = 1 to 100
n = 0 to 100, provided that when b+c=0, n is a positive number and when n is 0, at least one of C and B must be "X—Q—A_y"
X = nil, —O—, —S—, —NH—, —NR—, H
A = —O—, —S—, —NH—, —NR—
Q = an organic radical, e.g., arylene, alkyl and/or heterocyclic
R = alkyl, aryl or heterocyclic
R′ = a recurring amidinotriazinyl moiety (s-triazine—NR—C(=N—)—) derived from the triazine starting material) or H
B = —X—Q—A_y—, X or —NR—C(=N—)—

C = —X—Q—A_v—, X, XH or —NR—C(=N—)—
d = number of unreacted R—N—CN groups
e = number of unreacted hydrogen containing functional groups

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3,960,784

BODIES OF EXPANDABLE SYNTHETIC RESINS AND METHOD OF PREPARATION

Louis C. Rubens, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Nov. 17, 1971, Ser. No. 199,772
Int. Cl.² C08J 9/18
U.S. Cl. 260—2.5 B 15 Claims

1. A method for the preparation of thermocollapse resistant synthetic resinous foamable bodies, the steps of the method comprising subjecting a crosslinkable linear uncrosslinked thermoplastic synthetic resinous body to an atmosphere of a volatile fluid expanding agent at a temperature and pressure which swells but does not dissolve the body, the pressure and temperature being sufficient to cause impregnation of the body by the expanding agent, while introducing crosslinking means into the body to provide a desired degree of crosslinking within the resinous body.

3,960,785

COMPOSITION AND METHOD FOR INHIBITING CURING SHRINKAGE IN ORGANIC PLASTIC SYSTEMS

Henry Nash Babcock, Old Greenwich, Conn., assignor to Construction Products Research, Inc., Old Greenwich, Conn.

Filed Mar. 13, 1972, Ser. No. 234,369
Int. Cl.² C08K 7/24; C08J 9/30, 9/00
U.S. Cl. 260—2.5 R 22 Claims

1. A method for inhibiting curing shrinkage in an organic fluidic plastic system comprising selecting a porous particulate solid material gas carrier inert to the system having a volume of releasable entrapped gas within its pores, incorporating the particulate solid material in the fluidic plastic system and controllably releasing the gas entrapped within the particulate solid material during curing of the system, without essentially altering the essential properties of the system, in such manner as to cause expansion of the system sufficient to offset the shrinkage tendency of the organic plastic system, said gas release being achievable without the application of heat.

3,960,786

PROCESS FOR PREPARING GRANULAR POROUS SILICONE RUBBERS

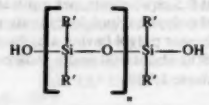
Taichiro Akiyama, 19-23, Shimoochiai 2-Chome, Shinjuku, Tokyo, Japan

Filed May 30, 1974, Ser. No. 474,850
Claims priority, application Japan, June 6, 1973, 48-62890
Int. Cl.² C08J 09/00
U.S. Cl. 260—2.5 S 6 Claims

1. A process for preparing granular porous silicone rubbers comprising the steps of preparing a composition containing a siloxanediol composition expressed by a formula

(1)

wherein R respectively represents a methyl radical, a phenyl radical or a vinyl radical and n is an integer of from 500 to 50,000, from 0.5 to 5% by weight based on the weight of the compound expressed by formula (1) of a siloxanediol hydride compound expressed by a formula



(2)

wherein R′ respectively represents a hydrogen radical or a methyl radical but at least one of the R′ radicals is a hydrogen radical, and n is an integer of from 2 to 1,000, a vulcanization catalyst, and an emulsifying agent, dispersing from 3 to 10% by weight of said composition in water based on the weight of the water, the amount of said emulsifying agent being 2 to 10% by weight based on the weight of said water, and vulcanizing the resulting emulsion while stirring same.

3,960,787

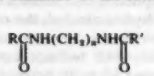
PROCESS FOR PREPARING FOAMABLE SYNTHETIC RESIN GRANULES

Hiroji Isukamoto, Osaka; Hisashi Morikawa, Takasago; Masao Nakagawa, Takasago; Shinji Kato, Takasago; Masaki Miyamoto, Yokohama; Toichiro Yoda, and Katsuhiko Yoshihara, both of Ibaragi, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 299,902, Oct. 24, 1972, abandoned.
This application June 6, 1974, Ser. No. 476,823
Claims priority, application Japan, Oct. 25, 1971, 46-84903
Int. Cl.² C08J 9/02; C08K 5/20; C08L 25/06
U.S. Cl. 260—2.5 B 13 Claims

1. Process for preparing foamable synthetic resin comprising the steps of

suspension polymerizing styrene, styrene derivative or monomer mixtures of 50% by weight or more of styrene, adding fatty acid bisamide of the formula



where R and R′ are alkyl group, and *n* is an integer from 1 to 6, to the polymerization system prior to polymerization or before the polymerization has proceded 15% of said polymerization step in the presence of a suspension agent, an initiator and inorganic salt selected from the group consisting of sodium tripolyphosphate, potassium sulfate and sodium sulfate, and

adding at least a normally gaseous foaming agent to said polymerization system at a late stage of polymerization or after completion of polymerization.

3,960,788

MODIFIED ISOCYANATE FOAMS

Michael Cuscurida, and Thomas Howard Austin, both of Austin, Tex., assignors to Jefferson Chemical Company, Inc., Houston, Tex.

Filed Sept. 23, 1974, Ser. No. 508,454
Int. Cl.² C08G 18/76
U.S. Cl. 260—2.5 AW 5 Claims

1. A modified cellular isocyanurate comprised of the reaction product, formed by bringing together in the presence of an inert blowing agent and an isocyanurate group formation catalyst, of:

a. a mixture of methylene-bridged polyphenylpolyisocyanates having an average functionality of about 2.1 to about 2.4 consisting essentially of from about 60% to about 75% by weight methylene diphenylisocyanate and from about 40% to about 25% by weight higher functionality methylene-bridged polyphenylpolyisocyanates, said methylene diphenylisocyanate having an isomer content consisting essentially of about 60% to about 80% by weight 4,4'-, about 18% to about 33% by weight 2,4'-, and about 2% to about 7% by weight 2,2'-isomers based on the total weight of said methylene diphenylisocyanate, and

b. about 0.1 to about 0.5 equivalents, per equivalent of said methylene-bridged polyphenylpolyisocyanate mixture, of a polyether or polyester polyol having a hydroxyl number of from about 100 to about 500 and a molecular weight of about 100 to about 1,000.

3,960,789

AQUEOUS COATING COMPOSITIONS COMPRISING FILM-FORMING POLYHYDROXY COMPONENT AND POLYVALENT FILM-FORMING RESIN WITHOUT POLYELECTROLYTE CHARACTER

Wolfgang Daimer, and Gert Dworak, both of Graz, Austria, assignors to Vianova-Kunstharz A. G., Vienna, Austria

Filed Aug. 19, 1974, Ser. No. 499,334

Claims priority, application Belgium, Aug. 20, 1973, 7217

Int. Cl.² C09D *3/52, 3/56, 3/66*

U.S. Cl. 260—21 **16 Claims**

9. An aqueous coating composition having a maximum of 40 percent of organic solvents based on the total solvents of said composition exhibiting viscosity characteristics upon dilution with water suitable for application by brushing, dipping, or spraying, comprising a resinous component (A) which includes a water-insoluble film-forming polyhydroxy component having an acid value below about 10 mg KOH/g and a hydroxyl number of from about 50 to 650 mg KOH/g, and a film-forming polycarboxy component having an acid value of from about 30 to 280 mg KOH/g, the ratio of carboxy group to hydroxy group in said resinous component (A) being from 1 : 2 to 1 : 25 and the carboxy groups being at least partially neutralized with a nitrogen base, and a polyvalent film-forming resin (B) without polyelectrolyte character and reactive with hydroxyl groups selected from the group consisting of condensation products of formaldehyde with urea, melamine, benzoguanamine, and phenol, and said condensation products esterified with a monohydric alcohol, the ratio of (A) and (B) being selected to provide an aqueous coating composition calculated as resin solids of 60 to 90 percent by weight of said resin component (A) and 10 to 40 percent of said polyvalent film-forming resin (B), said composition being diluted with water to provide a composition having a resin solids content of from about 35 to 60 percent.

3,960,790

DISC RECORD AND METHOD OF COMPOUNDING DISC RECORD COMPOSITION

Sarwan Kumar Khanna, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 25, 1974, Ser. No. 454,156

Int. Cl.² C08L *91/00*

U.S. Cl. 260—23 XA **1 Claim**

1. A method of compounding a composition suitable for molding high quality disc records, all proportions of ingredients being expressed as % by weight of the final product, said method consisting essentially of:

in a mixer, compounding about 60–70% of a copolymer of vinyl chloride-vinyl acetate resin suspension or solution containing about 12–16% vinyl acetate, about 26.2–36.2% of a suspension or solution type homopolymer of vinyl chloride having an inherent viscosity of about 0.65 and 0.2% of carbon black having a fineness of 181 Angstroms, and raising the temperature of the composition to about 115°–120° F,

adding 1.2% of a 50% solution of N,N-bis(2-hydroxyethyl)-N-(3'-dodecyloxy-2'hydroxypropyl)methyl-ammonium methosulfate, and raising the temperature of the composition to about 125°–130° F,

adding to the mixture about 1.6% of a sulfur-free organotin stabilizer compound containing about 16% by wt. of tin, and about 1% of a soybean oil epoxide having a molecular wt. of about 1000 and raising the temperature of the composition to about 135°–140° F,

adding to the mixture about 0.4% of an esterified montan wax and raising the temperature of the composition to about 150°–155° F, and removing moisture and other volatiles from the mixture,

rapidly cooling the composition to a temperature of about 100° F,

mixing the cooled, dry blend of ingredients such that they are homogeneously fused into a melted mass, and

cooling the melted mass.

3,960,791

POWDER COATING COMPOSITION FOR ELECTRODEPOSITION

Taizo Kondo; Komaharu Matsui, and Kunio Yamamoto, all of Hiratsuka, Japan, assignors to Kansai Paint Company, Ltd., Japan

Division of Ser. No. 211,660, Dec. 23, 1971, abandoned. This application Apr. 29, 1974, Ser. No. 465,078

Int. Cl.² C08L *33/06;* **C25D** *13/06, 13/10*

U.S. Cl. 260—23 AR **9 Claims**

1. A powder coating composition for electrodeposition which comprises powdery particles of an acrylic resin powder coating composition having 0.1–50 microns particle size wet with an organic liquid which does not dissolve the powdery particles and is nearly insoluble in aqueous medium and which has a boiling point of 50°14 250° C. in the range of 5–100 parts by weight per 100 parts by weight of the powdery particel, said wet powdery particles dispersed in an aqueous medium containing 0.05–5 parts by weight per 100 parts by weight of the powdery particles of an ionic surface active agent.

3,960,792

PLASTIC FOAM

Masao Nakamura, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 743,639, July 10, 1968, abandoned, which is a continuation-in-part of Ser. No. 519,190, Jan. 7, 1966, abandoned, which is a continuation-in-part of Ser. No. 251,765, Jan. 16, 1963, abandoned. This application Sept. 2, 1971, Ser. No. 177,456

Int. Cl.² C08J *9/30*

U.S. Cl. 260—2.5 E **5 Claims**

1. In a process for the preparation of an expanded closed cell polystyrene resin which includes incorporated within said polystyrene resin a volatile fluid foaming agent which is a non-solvent for the polystyrene resin, subsequently expanding the polystyrene resin containing the fluid foaming agent by subjecting the expandable resin containing the fluid foaming agent to a pressure sufficiently low to permit the polystyrene resin to expand when the polystyrene resin containing the fluid foaming agent is in a heat plastified condition, and subsequently cooling the expanded polystyrene resin to form a closed cell polystyrene resin body, the improvement which comprises

preparing a dimensionally stable expanded closed cell body by employing as the fluid foaming agent a volatile material which has a diffusion rate through the polystyrene resin which is about 0.75 to 6 times the diffusion rate of air through polystyrene resin, and the foaming agent consisting essentially of a mixture of at least two compounds having carbon chemically combined therein.

3,960,793

ADHESIVE COMPOSITIONS AND METHODS

David S. Bosniack, Baytown, Tex., assignor to Exxon Research and Engineering Company, Linden, N.J.

Division of Ser. No. 388,707, Aug. 15, 1973, Pat. No. 3,887,422, which is a continuation-in-part of Ser. No. 245,389, April 19, 1972, abandoned. This application Dec. 11, 1974, Ser. No. 531,513

Int. Cl.² C08L 91/00, 95/00

U.S. Cl. 260—28.5 AS 5 Claims

1. A composition comprising (i) from about 20 to about 80 weight percent of a reject polypropylene containing, on a dry basis, from about 5 to about 95 weight percent of atactic polypropylene, from about 95 to about 5 weight percent of isotactic polypropylene, and from about 1 to about 20 weight percent of inorganic salts from the polypropylene manufacturing process and (ii) from about 80 to about 20 weight percent of asphalt.

3,960,794

MANUFACTURE OF AQUEOUS SUSPENSIONS OF POLYOLEFIN FIBRIDS

Bruno Sander, Ludwigshafen; Heinz Berbner, Moerlenbach, and Manfred Hoffmann, Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Sept. 3, 1974, Ser. No. 502,665

Claims priority, application Germany, Sept. 13, 1973, 2346081

Int. Cl.² D21D 3/00; C08L 23/06, 61/32

U.S. Cl. 260—17.3 2 Claims

1. A process for the manufacture of aqueous suspensions of polyolefin fibrids by dispersing polyolefin fibrids in water in the presence of a dispersing agent, wherein the dispersing agent used is 0.1 to 2% by weight, based on the dry weight of said fibrids, of a melamine/formaldehyde/aminocarboxylic acid alkali metal salt polycondensate produced by polycondensation of monomers consisting of melamine, formaldehyde and an alkali metal salt of an aminocarboxylic acid in aqueous solution in a molar ratio of melamine to formaldehyde of from 1:1.8 to 1:3 and 0.1 to 0.5 mole of said alkali metal salt per mole of melamine, which polycondensate has a viscosity of from 10 to 120 centipoise at 20°C in 30% w/w aqueous solution.

2. A process as claimed in claim 1, wherein the aqueous suspensions of polyolefin fibrids additionally contain cellulose fibers.

3,960,795

HYDROLYZED REACTION PRODUCT OF A POLYEPOXIDE WITH A PHENOLIC COMPOUND HAVING A GROUP HYDROLYZABLE TO CARBOXYL

Rostyslaw Dowbenko, Gibsonia, and Joseph R. Marchetti, Greensburg, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Aug. 13, 1974, Ser. No. 497,004

Int. Cl.² C08G 59/16; C08J 3/06; C25D 13/06

U.S. Cl. 260—29.2 EP 18 Claims

1. A solubilized aqueous composition formed from reacting and then subsequently hydrolyzing

A. a polyepoxide having an epoxy equivalency greater than 1.0; and

B. a compound containing at least one phenolic hydroxyl group and containing at least one group hydrolyzable to a carboxyl group and having the following structural formula:

$$(HO)_n R\text{-}(W)_m$$

wherein n and m are integers of at least 1 and preferably 1 to 4, wherein R is an organic radical containing at least one aryl group, and wherein at least one of the hydroxyl groups is attached to at least one of the aryl groups of R; W is a group hydrolyzable to a carboxyl group selected from the group consisting of —COOR′, —CON(R″)₂ and —CN, where R′ is a lower alkyl group of from 1 to 4 carbon atoms, and R″ is selected from the group consisting of hydrogen, lower alkyl and mixtures thereof or wherein (B) is phenolphthalein.

3,960,796

RUBBERY VINYL PYRIDINE LATEX AND CHLOROPHENOLIC COMPOSITION FOR POLYESTER TIRE CORD DIP

Richard M. Wise, Uniontown, Ohio, assignor to The General Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 310,525, Nov. 29, 1972, Pat. No. 3,861,980. This application Sept. 20, 1974, Ser. No. 507,829

Int. Cl.² C08L 9/08, 39/08

U.S. Cl. 260—29.3 5 Claims

1. An aqueous alkaline dispersion useful as a polyester tire cord dip, the solids of the dispersion consisting essentially of a major amount by weight of a rubbery vinyl pyridine copolymer and an minor amount by weight of a heat reactable 2,6-bis(2,4-dihydroxy phenyl methyl)-4-chlorophenol composition made by the process of first reacting about 2 mols of formaldehyde with 1 mol of parachloro phenol to provide 2,6-dimethylol-4-chlorophenol which then is reacted with about 2 mols of resorcinol to give the heat reactable bis(dihydroxy phenylmethyl) chlorophenol composition.

3,960,797

WATER-IN-OIL EMULSIONS OF FLUOROALKYL POLYMER, CHLORINATED ALKANE SOLVENT AND NON-IONIC SURFACTANT

Charles Edward Inman, Glenside, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Dec. 28, 1973, Ser. No. 429,465

Int. Cl.² C08L 27/12

U.S. Cl. 260—29.6 F 10 Claims

1. A composition in the form of an emulsion, or which can readily be converted into an emulsion by shaking, consisting essentially of a major proportion of chlorinated alkane solvent having one to three carbon atoms and minor proportions of water and finely-dispersed fluoroalkyl polymer solids containing pendant C_6 to C_{16} fluoroalkyl groups and having oil and water repellent properties, said fluoroalkyl polymer solids being present in a minimum amount of about 0.05 parts per 100 parts by weight of emulsion, and an emulsion-stabilizing amount of nonionic surfactant having an HLB value of from 8 to about 20 and which is selected from the group consisting of the polyoxyethylene adducts of sorbitan fatty acid ester, glycerol fatty acid esters, fatty acids, and fatty alcohols, wherein there are 16 to 18 carbon atoms in the fatty acid or fatty alcohol moiety.

3,960,798

PROCESS FOR REGULATING HARDENING SPEED OF SELF-HARDENING MOLD

Tetsuo Nakazawa, Tokyo, and Osamu Nishida, Saitama, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Aug. 26, 1974, Ser. No. 500,693

Int. Cl.² C08L 29/00

U.S. Cl. 260—29.6 BM 14 Claims

1. A process for regulating the hardening speed of a self-hardening mold which comprises adding 0.1 to 3 parts by weight of an aliphatic alcohol as a hardening speed regulating agent when a mold is formed with a molding sand prepared by adding 1 to 10 parts by weight of a polyvinyl alcohol solution having a concentration of 5 to 30% by weight and from 0.01 to 2.1 parts by weight of a boron compound to 100 parts by weight of refractory particles and then kneading the mixture.

3,960,799

HEAT-RESISTANT ADHESIVE LACQUERS AS WIRE COATINGS

Hans Mosimann, Breitenbach; Peter Heim, Basel, and Charles Borer, Grindel, all of Switzerland, assignors to Schweizerische Isola-Werke, Switzerland

Filed Sept. 12, 1974, Ser. No. 505,498

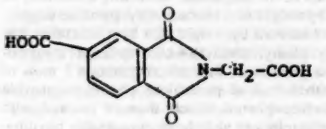
Claims priority, application Switzerland, Sept. 13, 1973, 13135/73

Int. Cl.² C08G 45/12, 51/44

U.S. Cl. 260—30.2 **6 Claims**

1. A heat-curable adhesive lacquer for coating electrically insulated wires consisting essentially of:

1. a polyurethane-ester-imide having terminal isocyanate groups blocked by a monohydric phenol, said polyurethane-ester-imide being derived from (A) an ester-imide containing hydroxyl groups obtained from a dicarboxylic acid of the formula:

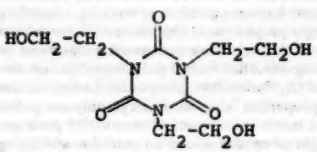


(a)

and a polyalcohol of the formula:

(b₁)

and of the formula:



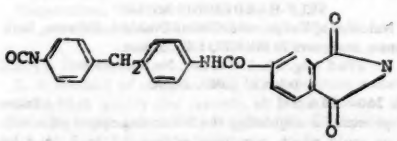
(b₂)

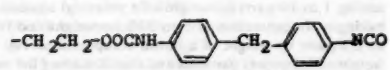
in the molar ratios:

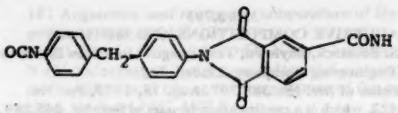
a : (b₁ + b₂) = 1 : 1.2 to 1 : 2

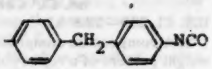
b₁ : b₂ = 1 : 1 to 10 : 1

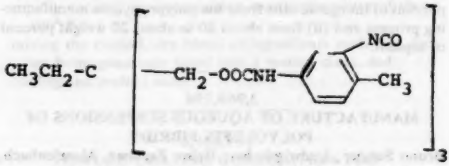
and (B) a polyisocyanate of the formula:



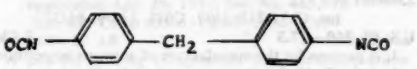








or



or a mixture of two or more thereof and the ratio of the hydroxyl groups to the isocyanate groups is from 1 : 1 to 1 : 1.5 and

2. an essentially linear epoxide resin having secondary hydroxyl groups and a molecular weight of at least 30,000,

the lacquer, on drying, being a storage-stable at room temperature and being in a non-adhesive state such that the lacquer softens on further heating to give a thermoset, adhesive, heat-stable resin.

3,960,800

ACETOXYSILOXANE ADHESION PROMOTER AND PRIMER COMPOSITION

Charles F. Kohl, Jr., Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

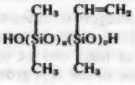
Filed Dec. 16, 1974, Ser. No. 533,102

Int. Cl.² C08K 5/07

U.S. Cl. 260—32.8 SB **12 Claims**

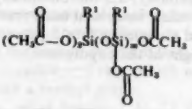
1. A composition consisting essentially of a reaction product obtained by mixing essentially anhydrous conditions

1. an organosiloxane of the formula



in which u has an average value of from 0 to 15, v has an average value of from 0 to 7 and the total of $u + v$ has an average of from 1 to 15 inclusive where the organosiloxane species having values of $u + v$ above 15, if present, are in no more than minor amounts and

2. an acetoxysilicon compound of the formula



where R^1 is methyl, ethyl or vinyl and m has an average value of from 0 to 5 inclusive, (1) and (2) being mixed in proportions to provide a ratio of acetoxy in (2) to hydroxyl in (1) of from 3/1 to 10/1, said reaction product containing at least one silicon-bonded vinyl radical.

3,960,801

PUMPABLE EPOXY RESIN COMPOSITION

Robert Clay Cole; Ronney R. Koch, and Joseph Ramos, all of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Division of Ser. No. 371,100, June 18, 1973. This application Apr. 4, 1974, Ser. No. 457,946

Int. Cl.² C08K *5/01;* **E02D** *3/12;* **E21B** *33/13*

U.S. Cl. 260—33.6 EP **13 Claims**

1. An epoxy resin composition for sealing a subterranean zone penetrated by a well bore containing about 20–40 parts by volume of an aromatic diluent selected to provide a pumpable epoxy resin composition wherein said aromatic diluent is selected to prevent premature setting by absorbing heat and to provide a cured epoxy resin composition occupying substantially the same volume as said pumpable epoxy resin; wherein said pumpable epoxy resin composition is curable to a high strength, impermeable matrix with a weight loss of less than about 20 parts per 100 parts by weight of said pumpable epoxy resin composition; said pumpable epoxy resin composition comprising an epoxy resin, a curing agent and said selected aromatic diluent; wherein said selected aromatic diluent is at least one or a mixture contaning an aromatic hydrocarbon of the general formual $C_6(R_1)_6$ wherein R_1 is hydrogen, a straight or branched chain alkyl radical, a cycloparaffin radical or a mixture thereof; wherein each alkyl and cycloparaffin radical has about 1–10 carbon atoms; and further wherein at least one R_1 group is radical.

3,960,802

PROCESS FOR THE MANUFACTURE OF A ONE-COMPONENT ROOM-TEMPERATURE VULCANIZABLE SILICONE COMPOSITION

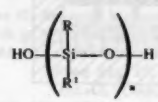
Melvin Dale Beers, Elnora; Harold Chura, Waterford, and Robert Joseph Robillard, Troy, all of N.Y., assignors to General Electric Company, Waterford, N.Y.

Filed Nov. 27, 1974, Ser. No. 527,689

Int. Cl.² C08L *83/04*

U.S. Cl. 260—37 SB **28 Claims**

1. A process for the preparation of a fluid composition that is stable under substantially anhydrous conditions and curable to a self-bonding elastic solid in the presence of moisture, said process comprising passing 100 parts by weight of a silanol chain stopped polydiorganosiloxane of the formula:



wherein R and R^1 are each, independently, organic radicals of up to 8 carbon atoms selected from hydrocarbyl, halohydrocarbyl and cyano lower alkyl and n is an average number of from about 10 to 15,000, from 0.01 to 5.0 parts by weight of a crosslinking silane of the formula:

$$R_m^2 Si(OR^3)_{4-m}$$

wherein R^2 and R^3 have the values defined for R and R^1 hereinabove and m has a value of 0 to 3 and an average value based on the total amount of silane in the composition of 0 to 1.99, and a silanol reactive organometallic ester compound of a metal, said compound having radicals attached to the metal atom, at least one of said radicals being a hydrocarbonoxy radical or a substituted hydrocarbonoxy radical, said radicals being attached to the metal atoms through M—O—C linkages wherein M is the metal and any remaining valences of the metal are satisfied by substituents selected from organic radicals which are attached to the metal atom through M—O—C linkages, —OH and —O— of a M—O—M linkage, the weight ratio of the silanol reactive organometallic ester compound to the cross-linking silane always being at least unity, through a devolatilizing extruder to form a vulcanizable fluid composition that is curable to a self-bonding elastic solid in the presence of moisture.

3,960,803

FLEXIBLE NONTACKY PREPREG FOR BONDING COILS IN HIGH VOLTAGE DEVICES AND METHOD OF MAKING SAID PREPREG

James D. B. Smith, Turtle Creek, and Robert N. Kauffman, Monroeville, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

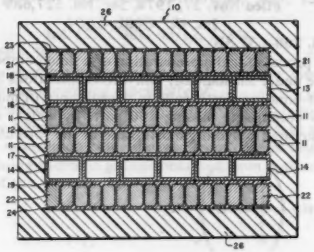
Filed June 22, 1973, Ser. No. 372,719

Int. Cl.² B32B *27/38;* **H01B** *13/06;* **C08F** *18/14;* **H01F** *27/32*

U.S. Cl. 260—37 EP **8 Claims**

1. A flexible nontacky prepreg, containing uncured resin, for bonding coils in high voltage devices comprising a fibrous mat material containing a substantially unreacted resinous mixture consisting essentially of an unreacted epoxy resin having an epoxy equivalent weight of between about 360 to about 400 and at least one sterically hindered anhydride

which is substantially unreactive with the epoxy resin at ambient temperatures, said mixture comprising 25 to 400% by



weight of said prepreg, said prepreg having a shelf life of at least six months and a power factor below 10% at 150°C.

3,960,804

METHOD OF MAKING SILICONE POLYMER WITH FILLERS DISPERSED THEREIN AND USING SAME TO MAKE SILICONE RUBBER

Maurice A. Minuto, 15 Hemmingway Drive, Huntington, N.Y. 11746

Continuation-in-part of Ser. No. 460,366, April 12, 1974, abandoned. This application Sept. 25, 1974, Ser. No. 509,275

Int. Cl.² C08L *83/04*

U.S. Cl. 260—37 SB **9 Claims**

1. A process for producing a homogeneous mass of silicone polymer having filler particles dispersed therein, which process comprises mixing said silicone polymer with said filler at elevated temperatures between about 0°F. and about 350°F., in a high-intensity mixer, said mixing being carried out for a period of time sufficient to disperse said filler particles in said silicone polymer such that said polymer becomes a continuous phase with said filler particles dispersed therethrough as the discontinuous phase.

3,960,805

DIRECT SYNTHESIS OF ORGANIC POLYMER-INORGANIC OXIDE COMPOSITES

Lynn Johnston Taylor, 3704 Dewlawn Drive, Toledo, Ohio 43614

Continuation-in-part of Ser. No. 462,321, April 19, 1974, Pat. No. 3,891,594, which is a continuation of Ser. No. 242,132, April 7, 1972, Pat. No. 3,817,911. This application May 19, 1975, Ser. No. 579,323

Int. Cl.² C08L *79/00, 67/00*

U.S. Cl. 260—37 N **11 Claims**

1. A process for preparation of a composite material of at least one organic polymer having at least one inorganic oxide dispersed therein, which process comprises:

a. mixing together at least one non-polymeric organic precursor and at least one inorganic-oxide hydrolyzable precursor in the presence of water;

b. synthesizing the inorganic oxide from the hydrolyzable precursor;

c. polymerizing the non-polymeric organic precursor so as to prepare the organic polymer in situ of the previously synthesized inorganic oxide; and

d. recovering the resulting composite material.

3,960,806

FLAME RESISTANT LINEAR POLYESTERS

Gerald Costa Najour, and Peter Ray Witt, both of Kinston, N.C., assignors to Emery Industries, Inc., Cincinnati, Ohio

Continuation of Ser. No. 449,780, March 11, 1974, Pat. No. 3,909,482, which is a continuation-in-part of Ser. No. 301,812, Oct. 30, 1972, abandoned. This application July 7, 1975, Ser. No. 591,918

Int. Cl.² C08J *3/20;* **C08G** *63/46*

U.S. Cl. 260—40 P **4 Claims**

1. A fiber-forming copolyester having excellent whiteness and increased flame retardance derived from dimethyl terephthalate, ethylene glycol and about 4 to 5 mol percent 2,2-bis-[4-(2-hydroxyethoxy)-3,5-dibromophenyl]propane based on glycol terephthalate structural units present in the copolyester product and containing 1 to 2 percent antimony oxide based on the weight of the copolyester.

3,960,807

THERMOFORMED POLYESTER ARTICLES HAVING IMPACT RESISTANCE AND HIGH TEMPERATURE DIMENSIONAL STABILITY

Larry S. McTaggart, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sept. 30, 1974, Ser. No. 510,451

Int. Cl.² C08L *67/02*

U.S. Cl. 260—40 R **9 Claims**

1. A shaped, thin-walled, thermoformed, heat-set polyester article the composition of which comprises:

A. a thermoplastic, crystallizable, polyester having a glass transition temperature of at least 50°C and a melting point of at least 149°C and an intrinsic viscosity of at least 0.75,

B. from 2–16% of a polymeric crack stopping agent, and

C. from 0.01% to 20% by weight of a nucleating agent.

3,960,808

POLYPHENYLENE ETHER COMPOSITION

Arthur Katchman, Delmar, N.Y., assignor to General Electric Company, Pittsfield, Mass.

Filed Feb. 8, 1974, Ser. No. 440,727

Int. Cl.² C08K *7/14;* **C08L** *53/02*

U.S. Cl. 260—42.18 **10 Claims**

1. A thermoplastic composition which comprises a polyphenylene ether resin, a rubber modified, high impact styrene resin and a homopolystyrene having a number average molecular weight between 30,000 and 60,000.

9. A composition as defined in claim 1 wherein said composition includes from 1 to 80% by weight of a filamentous glass filler.

3,960,809

COMPOSITIONS STABILIZED WITH HINDERED PIPERIDINE CARBOXYLIC ACIDS

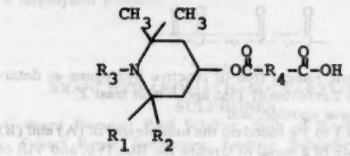
Chester R. Ramey, Spring Valley, and John J. Luzzi, Carmel, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 28, 1973, Ser. No. 429,231

Int. Cl.² C08K *5/13, 5/34*

U.S. Cl. 260—45.75 N **14 Claims**

1. A composition of matter comprising a synthetic organic polymer normally subject to deterioration stabilized with 0.005 to 5% of a stabilizer having the formula



wherein

R_1 and R_2 independently of each other are straight or branched-chain alkyl having from 1 to 6 carbon atoms, or together with the carbon to which they are bound form a cyclopentyl or cyclohexyl ring, which is unsubstituted or substituted with a methyl group.

R_3 is hydrogen, alkyl having 1 to 12 carbon atoms, β-methoxyethyl, alkenyl having 3 to 4 carbon atoms, propargyl, benzyl or alkyl substituted benzyl, and

R_4 is straight- or branched-chain alkylene having 1 to 4 carbon atoms, and

wherein the reactants from which the synthetic organic polymer is derived are substantially free of chemical groups which would react by condensation with the carboxylic acid group of the stabilizer.

3,960,810

COATING PROCESS

Grish Chandra, Glamorgan, Wales, and Colin Mostyn Rowland, Brussels, Belgium , assignors to Dow Corning Limited, Barry Glamorgan, Wales

Division of Ser. No. 479,245, June 14, 1974, Pat. No. 3,928,629. This application Apr. 10, 1975, Ser. No. 566,857

Int. Cl.² C08G 77/04

U.S. Cl. 260—46.5 UA **4 Claims**

1. A composition having a viscosity not exceeding 4,000 cS at 25°C and comprising (1) a polydiorganosiloxane having a viscosity in the range from 50 to 4,000 cS at 25°C wherein from 0.1 to 15 per cent of the total silicon-bonded radicals are vinyl radicals, there being at least two vinyl radicals per molecule and at least 80 per cent of the remaining silicon-bonded radicals being methyl radicals (2) an organohydrogenpolysiloxane having therein silicon-bonded hydrogen atoms and silicon-bonded organic radicals selected from methyl, ethyl and phenyl radicals, there being in the molecule on average at least three silicon-bonded hydrogen atoms, and no more than 20 molar per cent of copolymeric diorganosiloxane units, and (3) a catalyst for the addition of SiH groups to silicon-bonded vinyl groups, said catalyst comprising one or more complexes of rhodium having the general formula

$$RhX_3(SR_2)_3 \qquad \text{(i)}$$

or

$$Rh_2(CO)_4X_2 \qquad \text{(ii)}$$

wherein each X represents a halogen atom and each R represents an alkyl, aryl, aralkyl or alkaryl radical having from 1 to 8 inclusive carbon atoms or the R'_2SiQ- group in which Q represents a divalent aliphatic hydrocarbon radical having from 1 to 6 inclusive carbon atoms or a $(CH_3)_2Si$— group not more than one R' per molecule being $(CH_3)_2Si$—, the ratio of silicon-bonded hydrogen atoms provided by (2) to silicon-bonded vinyl radicals provided by (1) being at least 0.5:1.

3,960,811

PROCESS FOR THE PREPARATION OF AN AMORPHOUS POLYPHENYLENE OXIDE

James G. Bennett, Menands, and Glenn D. Cooper, Delmar, both of N.Y., assignors to General Electric Company, Pittsfield, Mass.

Filed Aug. 19, 1970, Ser. No. 65,286

Int. Cl.² C08G 65/44, 65/46, 65/48

U.S. Cl. 260—47 ET **5 Claims**

1. A process for the preparation of a completely amorphous polyphenylene oxide having a degree of polymerization of at least 100 from a polyphenylene oxide with 30 to 40% crystallinity which comprises providing a solution of said polyphenylene oxide with 30 to 40% crystallinity in toluene and adding said solution to methanol until the precipitation of said amorphous polyphenylene oxide is substantially complete and recovering said amorphous polyphenylene oxide.

3,960,812

COMPOSITIONS OF NEW IMIDES OF UNSATURATED DICARBOXYLIC ACIDS AND AZOMETHINES

Alfred Renner, Munchenstein , and Theobald Haug, Frenkendorf, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed July 20, 1973, Ser. No. 381,328

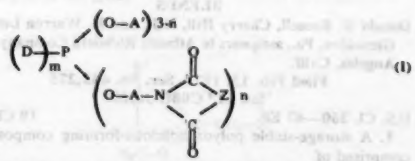
Claims priority, application Switzerland, Oct. 10, 1972, 14887/72

Int. Cl.³ C08G 73/12

U.S. Cl. 260—47 UA **8 Claims**

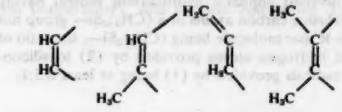
1. A storage-stable, heat-curable composition of matter, which comprises

a. a bis-imide, a tris-imide or a mixture thereof of the general formula



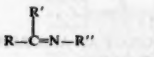
(I)

wherein A and A' are aromatic radicals, aromatic radicals which are substituted by alkyl radicals with 1–4 carbon atoms, halogen atoms, the nitro group, the tertiary amino group, the alkoxy group, the carbalkoxy group or the carbamide group or aromatic radicals which are bridged by an oxygen atom, an alkylene group or a sulphonyl group, Z is a radical of the formulae

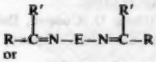


D denotes an oxygen or sulphur atom, *m* denotes the number 1 or 0 and *n* denotes the number 2 or 3, and

b. an azomethine of the general formula

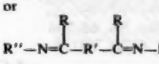


(VI)



(VII)

or



(VIII)

wherein, in the formulae, R denotes a hydrogen atom, a linear or branched aliphatic hydrocarbon radical with up to 12 carbon atoms, a cycloaliphatic or cycloaliphatic-aliphatic hydrocarbon radical with up to 12 carbon atoms, an aromatic radical with 6–12 carbon atoms, or an araliphatic hydrocarbon radical with up to 20 carbon atoms, R′ and R″, with the exception of the meaning of a hydrogen atom, have the same meaning as R, and R′ together with R and with the inclusion of the carbon atoms carrying the two substituents can also denote a cycloaliphatic ring system, and E denotes a divalent organic radical with at least 2 and at most 30 carbon atoms and wherein the molar ratio of imides of the formula I to the azomethines of the formula VI is from 1:1.5 to 3:1.5 and the molar ratio of imides of the formula I to the azomethines of the formula VII or VIII is from 1.3:1 to 4:1.

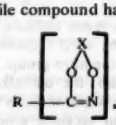
3,960,813
ZINC CHLORIDE AS CATALYST FOR EPOXY/ADNC BLENDS

Donald H. Russell, Cherry Hill, N.J., and R. Warren Lenton, Glenolden, Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

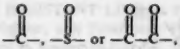
Filed Feb. 13, 1974, Ser. No. 442,275
Int. Cl.² C08G *30/10*
U.S. Cl. 260—47 EP **18 Claims**

1. A storage-stable polyoxazolidone-forming composition comprised of

A. A cyclic nitrile compound having the structural formula



wherein X is



R is an organic radical free of reactive hydrogens as determined by the Zerewitinoff Test and n is at least 2,

B. An oxirons epoxide, and

C. About 0.1 to 5% based on the total weight of (A) and (B) of a halide of a metal of Groups II*b*, III*a*, IV*a*, and VIII of the Periodic Table,

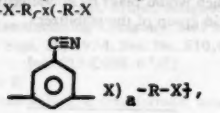
the cyclic nitrile compound and the epoxide being present in amounts such that the ratio of cyclic nitrile groups to epoxy groups is about 0.7 to 10:1.

3,960,814
POLY (PERFLUOROALKYLENE OXIDE) OXADIAZOLES AND THEIR SYNTHESIS

Robert E. Cochoy, Dayton, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

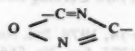
Filed Feb. 27, 1975, Ser. No. 553,701
Int. Cl.² C08G *73/06*
U.S. Cl. 260—47 R **14 Claims**

1. A poly(perfluoroalkylene oxide)oxadiazole consisting essentially of repeating units having the following structural formula $\{R_f X\text{-}R\text{-}X\text{-}R_f x(\text{-}R\text{-}X$



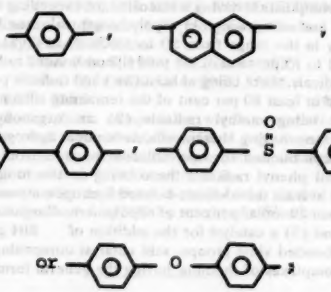
$X)_a\text{-}R\text{-}X\}$,

where R_f is $-CF_2(OCF_2CF_2)_m—O—(CF_2)_s—O—(CF_2CF_2O)_n—CF_2—$, in which *m* and *n* are each an integer equal to at least 1 and the sum of *m* and *n* is in the range of 2 to 12, inclusive; where x is



;

where R is



and where *a* is in the range of 0.04 to 1.0.

7. A process for synthesizing a poly(perfluoroalkylenes oxide)oxadiazole which comprises the steps of (1) adding to a reaction zone an aromatic dinitrile N-oxide; a perfluoroalkylene oxide dinitrile; 1,3,5-tricyanobenzene; and a fluorinated solvent in which the 1,3,5-tricyanobenzene is insoluble; (2) after the aromatic dinitrile N-oxide and the perfluoroalkylene oxide dinitrile have reacted with one another to form a polymeric material, adding to the reaction zone a solvent, misicible with the fluorinated solvent, in which the 1,3,5-tricyanobenzene is soluble; and (3) reacting the 1,3,5-

tricyanobenzene with the polymeric material, thereby forming a terpolymer product.

3,960,815
BRANCHED AROMATIC POLYARYL-ETHER SULPHONES

Gerhard Darsow; Paul Schiller, both of Krefeld-Urdingen; Eckart Reese, Dormagen; Ludwig Bottenbruch, Krefeld-Bockum; Rudolph Binsack; Hugo Vernaleken, both of Krefeld, and Joachim Wank, Zons, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

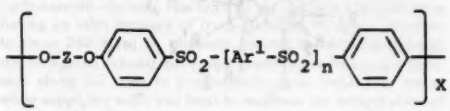
Filed Jan. 29, 1974, Ser. No. 437,643

Claims priority, application Germany, Feb. 3, 1973, 2305413

Int. Cl.² C08G 75/23

U.S. Cl. 260—49 **6 Claims**

1. A branched, high-molecular weight, thermoplastic polyaryl-ether sulphone consisting essentially of bivalent structural elements of the formula

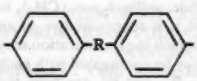


where

Ar^1 is a biphenylene radical or an oxybiphenylene radical,

n is 0 or 1,

Z is a p-phenylene radical, an m-phenylene radical or a bivalent radical of the formula V



(V)

where

R is a bivalent C_1–C_{12} alkylene or alkylidene radical, a C_5–C_{12} cycloalkylene or cycloalkylidene radical, a C_7–C_{12} aralkylene or aralkylidene radical or a C_6–C_{12} arylene-bisalkylidene radical or the group —O—, —S—, —SO—, —SO_2—, —CO— or a simple bond and wherein

X is an integer between about 10 and 120,

and trivalent structural elements derived from an aromatic compound having at least three aromatically linked alkali metal hydroxylate substituents and/or from a halogenaryl compound having at least three aryl-linked halogen substituents, said halogenaryl compound containing an electron-attracting group; and which is the condensation reaction product of approximately equimolar amounts of an aromatic dialkali metal bishydroxylate and a bis-(4-halogenaryl) compound, whose aryl nuclei are linked by sulphonyl groups, and about 0.01 to about 2 mol %, based on the bishydroxylate or bis-(4-halogenaryl) compound, of an aromatic compound having at least three aromatically linked alkali metal hydroxylate substitutents and/or of a halogenaryl compound having at least three aryl-linked halogen substitutents, said halogenaryl compound containing an electron-attracting group.

3,960,816
PROCESS FOR THE PREPARATION OF A NO-BAKE SAND CORE FROM AN OXAZOLINE CONDENSATE AS BINDER

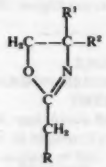
Louis A. Jurisch, Marengo, Ill., assignor to Commercial Solvents Corporation, Terre Haute, Ind.

Division of Ser. No. 378,366, July 11, 1973, Pat. No. 3,919,135. This application Jan. 6, 1975, Ser. No. 538,646

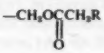
Int. Cl.² C08G 12/44

U.S. Cl. 260—73 L **9 Claims**

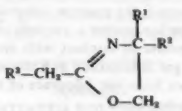
1. In the foundry process of mixing foundry sand with a binding amount of up to 10% by weight based on said sand of a no-bake binder to thereby form a foundry mix, said no-bake binder being (a) as a first part, a synthetic drying oil , and (b) as a second part, polyisocyanate; from 10–50 weight percent polyisocyanate being present based on the weight of drying oil, the improvement consisting of using as said drying oil a mono-oxazoline corresponding to the formula



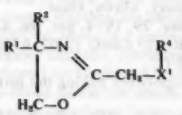
wherein R^1 and R^2 are methyl, ethyl, hydroxymethyl or acyloxymethyl corresponding to the formula



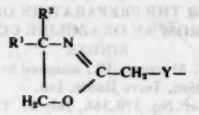
and are the same or different, R is hydrogen or an alkyl or alkenyl group of from 1 to 18 carbon atoms, or a bis- or trisoxazoline corresponding to the formula



where R^3 is the group



wherein X^1 is any divalent or trivalent saturated or unsaturated aliphatic hydrocarbon group of from 0 to 32 carbon atoms, and when X^1 is divalent, R^4 is hydrogen and when X^1 is trivalent, R^4 is the group



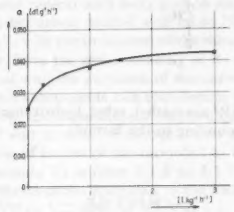
wherein Y is a saturated or unsaturated hydrocarbon of 16 carbon atoms.

3,960,817

SOLID PHASE POLYESTER POLYCONDENSATION

Gottfried Morawetz, and Lothar Buxbaum, both of Kufstein, Austria, assignors to Ciba-Geigy AG, Switzerland

Continuation of Ser. No. 192,048, Oct. 26, 1971, abandoned. This application Aug. 30, 1973, Ser. No. 392,934
Claims priority, application Austria, Oct. 23, 1970, 9574/70
Int. Cl.² C08G *17/003*
U.S. Cl. 260—75 M **15 Claims**



1. A process for solid phase polycondensation of particles of thermoplastic polyester melt precondensate at an essentially constant temperature of from 5° to 50° C below the melting point of the precondensate and under vacuum and streaming inert gas and wherein intrinsic viscosity of the precondensate is increased, the process comprising effecting solid phase polycondensation under a vacuum of less than 1 torr, with the precondensate in contact with an inert gas stream, and with the inert gas maintained at a streaming rate which is less than 2 liters per hour per kilogram of the precondensate during the polycondensation.

3,960,818

ORDERED AROMATIC COPOLYAMIDE UREA POLYMER

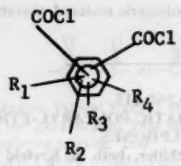
John W. Spiewak, Akron, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

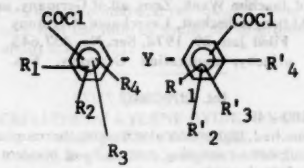
Filed Nov. 29, 1974, Ser. No. 528,307
Int. Cl.² C08G *71/02, 63/62*
U.S. Cl. 260—77.5 C **6 Claims**

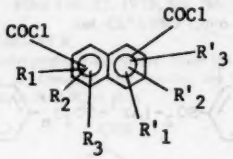
1. An ordered copolymer having the formula

---NH—Ar—NH—C:O—NH—Ar'—NH-C:O-Ar''—
C:O---

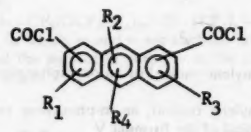
in which Ar and Ar' are of the class consisting of (a) arylene and (b) diarylene X groups in which X may be a covalent bond or a group from the class consisting of sulfonyl, oxygen, alkylene of 1 to 10 carbon atoms, and Ar'' is the residue of diacid chloride after removal of the chlorine atoms of the formula







or



in which Y is from the class consisting of sulfonyl, oxygen, carbonyl, carbonate, sulfide, disulfide, sulfinyl, azo, $(CH_2)_n$ in which n may be 1 to 50 and $(CH_2)_n$ is representative of an alkylene or unsaturated moiety in which the unsaturation may be isolated or the carbon groups may be conjugated with each other and R_1, R_2, R_3, R_4, R'_1, R'_2, R'_3 and R'_4 are from the class consisting of hydrogen, alkyl, aryl, heteroalkyl, heteroaryl, alkenyl and alkynyl.

3,960,819

CATALYTIC PREPARATION OF POLYAMIDES FROM BIS(AMINOPHENYL)SULPHONE

Eileen Jones; Arthur Morris; Ieuan Thomas, and James Rodney Traynor, all of Runcorn, England, assignors to Imperial Chemical Industries, Inc., London, England

Continuation of Ser. No. 177,831, Sept. 3, 1971, abandoned. This application Mar. 4, 1974, Ser. No. 447,992
Claims priority, application United Kingdom, Sept. 3, 1970, 42220/70
Int. Cl.² C08G *69/28*
U.S. Cl. 260—78 R **4 Claims**

1. A process for the production of a moldable or film- or fiber-forming polyamide in which at least one bis(aminophenyl)sulfone, or amide-forming derivative thereof, and at least one dicarboxylic acid, or amide-forming derivative thereof, in substantially equimolar proportions are heated together at 160° to 330°C under an inert atmosphere in the presence of a catalyst selected from the group consisting of at least one compound having the formula $(RO)_3R$ E=O and a product of mixing at least one compound having the formula

$(RO)_3R'E{=}O$ with at least one metal salt, said metal salt being a member of the group consisting of oxides, acetates, acetyl acetonates, halides and hydroxides of zinc, manganese, lanthanum, calcium, aluminum, magnesium, cobalt, cadmium, nickel, chromium, titanium, cerium, zirconium, thorium, and alkali metals, where R is selected from the group consisting of alkyl groups and phenyl groups and E is an element of Group VB of the periodic table of the elements having an atomic number greater than 7.

3,960,820

REGULATING THE FLOW OF MOLTEN POLYAMIDES IN A CONTINUOUS PROCESS FOR THE PREPARATION THEREOF

Baden McDowall Pinney, Kingston, Canada, assignor to Du Pont of Canada Limited, Montreal, Canada

Filed Nov. 8, 1974, Ser. No. 522,111
Claims priority, application Canada, Feb. 27, 1974, 193616
Int. Cl.² C08G *69/16, 69/28*
U.S. Cl. 260—78 R **9 Claims**

1. In a process for the continuous preparation of aliphatic polycarbonamide from an aqueous solution of aliphatic polycarbonamide -forming reactants that includes the steps of, feeding continuously the aqueous solution of aliphatic polycarbonamide -forming reactants to an elongated tubular zone having an inlet pressure of from about 60 lb./sq. in. absolute to about 250 lb./sq. in. absolute, passing the solution through the elongated tubular zone and gradually reducing the pressure along the zone to progressively flash water into steam while supplying sufficient heat to maintain the temperature of the solution above the melting point of the resultant aliphatic polycarbonamide, said pressure in said zone cycling above and below a set point, and passing the molten aliphatic polycarbonamide from the elongated tubular zone into a vessel, the improvement for maintaining a substantially constant level in said vessel comprising: injecting steam at an intermediate point in the tubular zone according to the pressure in said tubular zone with respect to said set point whereby said cycling above and below said set point is substantially eliminated thus regulating the flow of molten aliphatic polycarbonamide from the tubular zone.

3,960,821

CHLORONITROSYLATED, CHLOROSULFONATED HYDROCARBON POLYMERS AND A PROCESS FOR THE PREPARATION THEREOF

Herwart C. Vogt, Grosse Ile; Charles F. Deck, Trenton, and Pauls Davis, Gibraltar, all of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Dec. 13, 1974, Ser. No. 532,323
Int. Cl.² C08F *28/02;* **C08G** *75/24;* **C08K** *5/02, 5/36*
U.S. Cl. 260—79.3 A **11 Claims**

1. A process for the preparation of a hydrocarbon polymer containing chlorosulfonic and chloronitroso groups which comprises contacting in the presence of a catalyst said polymer with sulfonyl chloride or sulfur dioxide and chlorine and nitrosyl chloride or chlorine and nitric oxide.

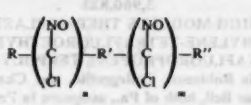
3,960,822

CROSSLINKING POLYMERS WITH CHLORONITROSO COMPOUNDS

Pauls Davis, Gibraltar; Herwart C Vogt, Grosse Ile, and Charles F. Deck, Trenton, all of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Oct. 10, 1974, Ser. No. 513,647
Int. Cl.² C08C *19/12, 19/32;* **C08F** *28/00*
U.S. Cl. 260—79.5 P **6 Claims**

1. A process for crosslinking a polymer which is selected from the group consisting of polyethylene, polypropylene, polystyrene, styrene-butadiene rubber, butyl rubber, natural rubber, polybutadiene, polyisobutylene, ethylenepropylene copolymers, 1,4-polyisoprene, ethylene-propylene dichloropentadiene terpolymer, polyvinyl chloride polymer, vinyl chloride-vinyl acetate copolymers, vinyl chloride-vinylidene chloride copolymers, chlorinated natural rubber, sulfochlorinated polyethylene, chloroprene, chlorinated butyl rubber, chlorinated polyethylene, chlorinated polypropylene, perfluoropropylene vinylidene fluoride and copolymers thereof which comprises reacting said polymer with a chloronitroso compound having the general formula



wherein R, R′, R″ are selected from the group consisting of hydrogen, methyl, ethyl, propyl, linear or cyclic butyl, pentyl, hexyl, heptyl, octyl, nonyl, decyl, undecyl, dodecyl, and tridecyl, *n* is an integer from 1 to 10, *m* is an integer from 0 to 10 and the amount of said chloronitroso compound is from about 0.01 to about 50 weight percent of the polymer.

3,960,823

HYDROCARBON RESINS AND COMPOSITIONS THEREOF

Hisataka Komai, and Atsuo Ishikawa, both of Kawasaki, Japan, assignors to Nippon Zeon Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 308,920, Nov. 22, 1972, abandoned. This application Apr. 18, 1974, Ser. No. 461,826
Claims priority, application Japan, Nov. 24, 1972, 46-94259; Feb. 16, 1972, 47-16252; Feb. 16, 1972, 47-16253
Int. Cl.² C08F *232/04, 2/06*
U.S. Cl. 526—237 **1 Claim**

1. Hydrocarbon resins having a softening point of 60°–140°C and a Gardner color of 6 or less and being soluble in a hydrocarbon solvent, prepared by polymerizing a monomeric mixture composed substantially of, based on the weight of the monomeric mixture, (A) 40–90% by weight of 1,3-pentadiene, (B) 10–60% by weight of cyclopentene and (C) 0–15% by weight of 1,3-butadiene or isobutene, the monomeric mixture being allowed to contain not more than 2% by weight of each of (D) isoprene, (E) cyclopentadiene and (F) dicyclopentadiene together with other C_4 - C_6 olefins in such amounts that the total of said three diolefins (D)-(F) and the other C_4 - C_6 olefins is not more than 5% by weight, in 20–1000 parts by weight per 100 parts by weight of the monomeric mixture, of a solvent containing not less than 50% by weight of aromatic hydrocarbons at temperatures of 0°–80°C in the presence of aluminum chloride as the catalyst.

3,960,824

MERCAPTAN INITIATED POLYMERIZATION PROCESS CARRIED OUT IN THE PRESENCE OF OXYGEN

Darrell D. Hicks, Jeffersontown, Ky., assignor to Celanese Coatings & Specialties Company, Louisville, Ky.

Filed July 9, 1971, Ser. No. 161,331
Int. Cl.² C08F *218/02, 220/06*
U.S. Cl. 526—85 **9 Claims**

1. A polymerization process which consists essentially of contacting polymerizable ethylenically unsaturated monomers with from about 0.01 to about 0.3 equivalent per mole of monomers of an organic aliphatic, cycloaliphatic, or aromatic mercaptan having from 1 up to about 4 thiol groups per molecule and from 1 to about 12 carbon atoms per thiol group in the presence of oxygen introduced below the surface of the monomers in an amount sufficient to keep a stream of bubbles containing oxygen in contact with the monomers at a temperature of from about 20°C. to about 200°C. for a time sufficient to obtain substantially complete conversion of the monomers to polymer, wherein the monomers are selected from at least one member of the group consisting of (a) polymerizable organic compounds containing a single ethylenic double bond

conjugated with a carbon oxygen double bond, (b) polymerizable organic compounds containing a single ethylenic double bond conjugated with a carbon to nitrogen triple bond, and (c) polymerizable organic compounds containing a single ethylenic double bond conjugated with a carbon atom in an aromatic nucleus.

3,960,825

HIGH-MODULUS THERMOPLASTIC ETHYLENE-TETRAFLUOROETHYLENE HEXAFLUOROPROPENE TERPOLYMERS

Donald Nellis Robinson, Collegeville, and Charles Benjamin Welsh, Blue Bell, both of Pa., assignors to Pennwalt Corporation, Philadelphia, Pa.

Filed Oct. 15, 1973, Ser. No. 406,753
Int. Cl.² C08F *210/02, 214/24*
U.S. Cl. 526—206 **16 Claims**

1. A high-modulus, nonelastic, tough, flexible, thermally stable, solvent resistant, high molecular weight, thermoplastic terpolymer composed of copolymerized units of, in mole percent, from 45% to 55% ethylene, from 40% to 50% tetrafluoroethylene, and 3% to 9% hexafluoropropylene, said terpolymer being obtained by the copolymerization of the monomers in aqueous medium containing in admixture 0.3 to 1%, based on monomers weight, of dialkyl peroxy dicarbonate as initiator and 10% to 150%, based on monomers weight, of 1,1,2-trichloro-1,2,2-trifluoroethane as reaction accelerator.

3,960,826

OLEFIN POLYMERIZATION PROCESS

Henri A. Aboutboul, Brussels, Belgium; William Kirch, Clinton, Iowa, and Jerome H. Krekeler, Cincinnati, Ohio, assignors to National Petro Chemicals Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 383,203, July 27, 1973, abandoned, which is a continuation of Ser. No. 122,503, March 9, 1971, abandoned, which is a division of Ser. No. 750,467, Aug. 6, 1968, abandoned, and a continuation-in-part of Ser. No. 294,270, Oct. 10, 1972, abandoned, Continuation of Ser. No. 70,622, Aug. 14, 1970, which is a continuation-in-part of Ser. No. 750,733, Aug. 6, 1968, Pat. No. 3,652,214, and a continuation-in-part of Ser. No. 750,734, Aug. 6, 1968, Pat. No. 3,652,215, and a continuation-in-part of Ser. No. 766,693, Oct. 11, 1968, Pat. No. 3,652,216, and a continuation-in-part of Ser. No. 326,645, Jan. 26, 1973, abandoned, which is a continuation of Ser. No. 148,117, May 28, 1971, abandoned, which is a continuation-in-part of Ser. No. 750,734, Aug. 6, 1968, Pat. No. 3,652,215. This application Aug. 12, 1974, Ser. No. 496,780
Int. Cl.² C08F *4/02, 4/24, 10/02, 10/00*
U.S. Cl. 526—103 **6 Claims**

1. A particle form polymerization process for the polymerization of an olefin, which comprises contacting a 1-olefin monomer, said 1-olefin having a maximum of 8 carbon atoms and no branching nearer the double bond than the 4-position, with a supported catalyst comprising a metal-containing catalytic material deposited on a silica xerogel support, said silica xerogel having

a. a nitrogen pore volume greater than 1.96 cc/g and up to 2.90 cc/g, said pore volume being equal to the volume of the pores in said gel having pore diameters of up to 600 A and being determined as that volume of nitrogen adsorbed by and condensed in the pores of said gel per gram of the dry gel at the normal boiling point of liquid nitrogen and at a relative pressure P/Po equal to 0.967 wherein P is the pressure of the nitrogen vapor over the gel and Po is the vapor pressure of liquid nitrogen;

b. the major portion of said nitrogen pore volume being provided by pores having pore diameters within the range of from 300–600 A; and

c. a surface area within the range of from 200–500 m^2/g; and

maintaining the reaction mixture containing the monomer and catalyst in slurry form and under temperature and pressure conditions effective for polymerization.

3,960,827

CANCER ASSOCIATED POLYPEPTIDE ANTIGEN, PROCESS FOR ITS PREPARATION, PROCESS FOR PREPARING ANTIBODIES, PROCESS OF CANCER DIAGNOSIS AND COMPOSITION USEFUL AS AN IMMUNIZING AGENT

Knut Bertil Björklund, Appelviksvagen 26, 161 36 Bromma, Sweden

Continuation-in-part of Ser. No. 270,273, July 10, 1972, abandoned. This application June 25, 1973, Ser. No. 373,004
Int. Cl.² C07G *7/00*
U.S. Cl. 260—112 R **19 Claims**

1. A process for the isolation of a cancer associated polypeptide antigen (CAPA) comprising the steps:

a. homogenizing CAPA-containing material in a liquid at a temperature not above about 0°C.

b. separating solids from the mixture of liquid homogenate and solids results from step a)

c. extracting said solids with an alkaline aqueous solution;

c'. heat-stabilizing the product by rapidly heating to a temperature range between about 95° and about 100° C. to destroy enzymes destructive to the CAPA;

d. filtering the extract resulting from step c') on a filtration gel of the molecular sieve type in bead form permitting fractionation of the compounds having a molecular weight range including $10 \cdot 10^6$ to $20 \cdot 10^6$, especially about $15 \cdot 10^6$, eluting the gel and recovering the $10 \cdot 10^6$ to $15 \cdot 10^6$ to $15 \cdot 10^6$ fraction, especially the fraction of about $15 \cdot 10^6$

d'. dissolving the sedimented active fractions from the gel filtration in a buffer of pH about 7;

e. subjecting the fraction resulting from step d') to chromatography on a weak ion exchanger equilibrated with a buffer of pH about 7 to adsorb thereon impurities and recovering the first fraction leaving said exchanger;

f. subjecting said first fraction to isoelectric precipitation,

f'. subjecting the fractions from the isoelectric precipitation to active-substance precipitation from aqueous solution at pH about 5, and dissolving the powder in water at pH about 8.5 and acidifying the clear solution with formic acid to produce a precipitate, and thereafter

g. mixing the resulting precipitate with a molecular sieve type gel and layering the mixture on top of a column of an identical molecular sieve type gel of the same isoelectric pH and subjecting said gel to pH gradient elution under gradually decreasing pH; and

h. while decreasing the pH, recovering the eluate fraction down to pH about 3 containing CAPA therein having a spectrophotometric absorption peak wave length at 229–233 nm and a molecular weight within the range of about 20,000 – 27,000.

3,960,828

CATALYTIC HYDROGENOLYSIS OF PROTECTED SULFUR CONTAINING PEPTIDES

Johannes Arnold Meienhofer, Upper Montclair, N.J., assignor to The United States of America as represented by the Department of Health, Education and Welfare, Washington, D.C.

Filed Mar. 20, 1974, Ser. No. 453,141
Int. Cl.² C07C *103/52;* C07G *7/00*
U.S. Cl. 260—112.5 R **6 Claims**

1. A process for the catalytic hydrogenolysis of sulfur containing peptide compounds also containing a benzyloxycarbonyl protective group labile to hydrogenolysis and additionally containing one or more protective groups which are stable to hydrogenolysis which process comprises reacting said sulfur compounds with hydrogen in the presence of palladium catalyst in a liquid ammonia solvent medium.

3,960,829

PROCESS FOR ACYLATION OF AMINO, IMINO AND HYDROXYL GROUPS USING PYRIMIDINE DERIVATIVES

Takeshi Nagasawa; Katumasa Kuroiwa, and Kouichi Narita, all of Koriyama, Japan, assignors to Nitto Boseki Co., Ltd., Fukushima, Japan

Division of Ser. No. 290,575, Sept. 20, 1972, Pat. No. 3,904,612. This application Sept. 25, 1974, Ser. No. 509,221

Claims priority, application Japan, Sept. 22, 1971, 46-74041; Sept. 23, 1971, 46-74237; Oct. 19, 1971, 46-82663

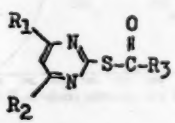
Int. Cl.² C07C *103/52, 69/00, 125/00*

U.S. Cl. 260—112.5 R 7 Claims

1. A process for the acylation of a compound having amino and/or imino and/or hydroxyl groups, comprising

reacting (1) a compound selected from the group consisting of aliphatic and alicyclic primary and secondary amines having up to about 12 carbons; nuclear unsubstituted or chlorine, nitro or methoxy nuclear substituted phenyl-C_{1-3} alkyl primary or secondary amines; nuclear unsubstituted or methyl, hydroxy, carbomethyl or ethoxy nuclear substituted phenyl or naphthyl primary or secondary amines; heterocyclic primary and secondary amines of 3–6 membered rings containing one or two nitrogens and which may contain fused benzene rings; hydrazine, N-phenyl and/or N-lower alkyl-substituted hydrazines wherein at least one hydrogen of the phenyl may be substituted by nitro; amino acids of natural occurrence having free amino and/or imino groups and protected carboxyl groups; α-methylalanine; oligopeptides obtained by coupling reaction of two or more said amino acids; saccharides and steroids having amino and/or imino and-/or hydroxyl groups; aliphatic alcohols having 1–12 carbons, phenol, cathechol, naphthol, benzyl alcohol and cyclohexanol,

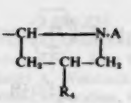
with (2) pyrimidine derivative of the formula,



(I)

wherein R_1 and R_2 are individually a hydrogen atom or a methyl group; and R_3 is C_{1-17} alkyl which may contain one or more halogens or hydroxyls, C_{2-17} alkenyl, phenyl which may contain hydroxyl, nitro, amino, dimethylamino or methyl, naphthyl, anthryl, 5- or 6-membered hetrocyclic ring which may contain one or more hetero atoms of O, N or S, phenyl-C_{1-5} alkyl which may contain methoxy, halogen, nitro or C_{1-2} alkyl on the benzene nucleus, phenyl-C_{2-5} alkenyl, a group of the formula

wherein R is a substituent at the α-carbon of an α-amino acid and A is hydrogen or an amine protective group for an amino acid,



wherein R_4 is hydrogen or hydroxyl and A is as defined above, $—CH_2CH_2NH.A$ wherein A is as defined above,

wherein A is as defined above or $—CH_2—(CH_2)_3—CH_2—NH.A$ wherein A is as defined above,

in an inert solvent in the presence or absence of a base at a temperature of from −50° to +100°C.

3,960,830

POLYALKYLENE GLYCOLS USED FOR THE PREPARATION OF PEPTIDES

Ernst Bayer, and Manfred Mutter, both of Tubingen, Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Dec. 4, 1974, Ser. No. 529,519

Claims priority, application Germany, Dec. 6, 1973, 2360794

Int. Cl.² C07C *103/52*

U.S. Cl. 260—112.5 R 2 Claims

1. In a process for synthesizing a peptide in a liquid phase by at least once forming a peptide bond between a carboxy group of an amino acid or peptide and an amino group of an amino acid or peptide, which latter amino acid or peptide has a carboxy group bound by an ester bond to an hydroxy group of a polymer which is

a. a polyalkylene glycol, the alkylene group of which has 2 or 3 carbon atoms, or

b. such a polyalkylene glycol which has been mono-esterified or mono-etherified, whereby a new polymer-bonded peptide is formed, and then cleaving said ester bond at the conclusion of the synthesis, the improvement wherein said polymer has a molecular weight between 2000 and 40000 and wherein, prior to cleavage of said ester bond, said polymer-bound peptide is crystallized at least once during the synthesis to separate it from said liquid phase.

3,960,831

DISAZO DYESTUFFS CONTAINING AMINO AZO BENZENE SULFONIC ACID AND PHENOLIC OR NAPHTHOLIC COUPLERS

Horst Nickel and Fritz Suckfull, both of Leverkusen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

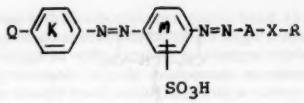
Filed May 1, 1970, Ser. No. 33,940

Claims priority, application Germany, May 9, 1969, 1923680

Int. Cl.² C09B *31/04, 31/06;* D06P *3/04, 3/24*

U.S. Cl. 260—186 1 Claim

1. Disazo dyestuff which in the form of the free acid corresponds to the formula



where Q is OH, alkoxy with 1–7 carbon atoms, hydroxy alkoxy with 1–7 carbon atoms, or benzyloxy; R is H;
where A is phenylene;
X is —O— or —NH—;
and wherein M is unsubstituted or substituted by a member of the group Cl, alkyl with 1–7 carbon atoms, benzyl, chlorobenzyl, alkoxy with 1–7 carbon atoms, hydroxy alkoxy with 1–7 carbon atoms or benzyloxy; and
wherein A and K independently are unsubstituted or substituted by a member of the group F, Cl, Br, NO_2, OH, cyclohexyl, alkyl with 1–7 carbon atoms, alkoxy with 1–4 carbon atoms, alkoxy carbonyl with 1–5 carbon atoms, phenyl, or chlorophenyl.

3,960,832

POLYSACCHARIDE AND BACTERIAL FERMENTATION PROCESS FOR ITS PREPARATION

Kenneth Suk Kang, 6808 Rockglen Ave., San Diego, Calif. 92111, and William H. McNeely, 5382 Hewlett Drive, San Diego, Calif. 92115

Division of Ser. No. 403,748, Oct. 5, 1973, Pat. No. 3,915,800, which is a continuation-in-part of Ser. No. 239,819, March 30, 1972, abandoned, which is a continuation of Ser. No. 854,322, Aug. 29, 1969, abandoned. This application Jan. 30, 1975, Ser. No. 545,454

Int. Cl.² C08B *37/00*; C12D *13/04*

U.S. Cl. 260—209 R **1 Claim**

1. The compound Heteropolysaccharide-7, said heteropolysaccharide having an acetyl content of about 8–10%, and the carbohydrate portion thereof consisting of about 73% glucose, about 16% rhamnose and about 11% of a uronic acid, said heteropolysaccharide being soluble in water.

3,960,833

BUTIROSIN A 3'',5''-O-ISOPROPYLIDENE DERIVATIVES

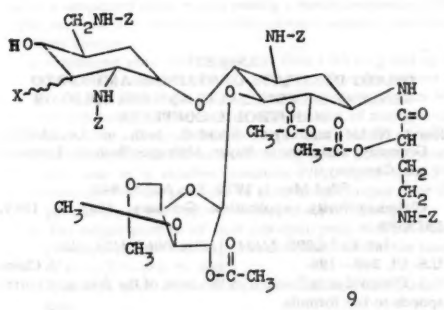
Takayuki Naito; Susumu Nakagawa, both of Tokyo, and Soichiro Toda, Koshigaya, all of Japan, assignors to Bristol-Myers Company, New York, N.Y.

Continuation-in-part of Ser. No. 527,983, Nov. 29, 1974, abandoned. This application Jan. 29, 1975, Ser. No. 544,994

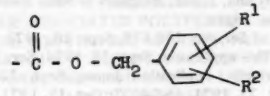
Int. Cl.² C07H *15/22*

U.S. Cl. 260—210 AB **2 Claims**

1. The compound having the formula



in which Z is a radical having the formula



in which R^1 and R^2 are alike or different and each are hydrogen, chloro, bromo, fluoro, hydroxy, nitro, CF_3, SO_3H, (lower-)alkyl of 1 to 3 carbon atoms or (lower)alkoxy of 1 to 3 carbon atoms and X is iodo, bromo or acylthio.

3,960,834

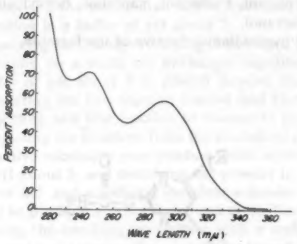
METHOD FOR PREPARING 3-(METHYLMERCAPTO) PROPYLAMINOBLEOMYCIN

Hamao Umezawa, Tokyo; Tomohisa Takita, Asaka; Akio Fujii, and Hiroko Ito, both of Tokyo, all of Japan, assignors to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai, Tokyo, Japan

Continuation-in-part of Ser. No. 177,332, Sept. 2, 1971, abandoned. This application Nov. 2, 1973, Ser. No. 412,128

Int. Cl.² C07H *7/06*

U.S. Cl. 260—210 AB **4 Claims**



1. 3-(Methylmercapto)propylaminobleomycin.

3,960,835

ZEARALINE GLYCOSIDE COMPOUNDS

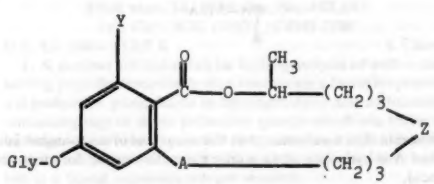
Donald E. Robertson, Terre Haute, Ind., assignor to Commercial Solvents Corporation, Terre Haute, Ind.

Filed Jan. 18, 1974, Ser. No. 434,405

Int. Cl.² C07H *15/00*

U.S. Cl. 260—210 R **16 Claims**

1. A compound of the formula



wherein —A— is either $-CH_2-CH_2-$ or $-CH=CH-$; >Z is either $>CH_2$, >C=O or >CH—OH; Y is —H or —OR′ wherein R′ is hydrogen, lower alkyl, lower alkanoyl, or monocyclic aryl lower-alkyl of about 7 to 15 carbon atoms; and Gly is a glycosyl group having about 4 to 5 ring carbon atoms.

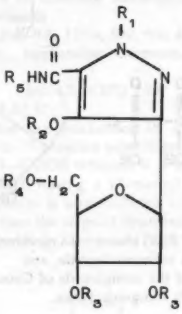
3,960,836

ACYLATED DERIVATIVES OF PYRAZOFURIN AND PROCESS FOR THEIR PREPARATION

Gerald E. Gutowski, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed July 22, 1974, Ser. No. 490,627
Int. Cl.² C07H 7/06
U.S. Cl. 260—210 AB 21 Claims

1. The compound having the formula



wherein:

R_1, R_2, R_3, and R_5 independently are hydrogen or C_1–C_6 alkanoyl;

R_4 is hydrogen, C_1–C_6 alkanoyl, palmitoyl, benzoyl, or adamantoyl;

with the limitations that at least one of R_1, R_2, R_3, R_4, or R_5 is a group other than hydrogen, that R_2 is alkanoyl only when R_1 is alkanoyl, that R_3 is alkanoyl only when R_4 is alkanoyl, and that R_5 is alkanoyl only when R_3 and R_4 are both alkanoyl.

3,960,837

POLYAMINE COMPOUNDS AND METHODS FOR THEIR PRODUCTION

Peter W. K. Woo, Ann Arbor, Mich., assignor to Parke, Davis & Company, Detroit, Mich.

Filed Sept. 6, 1974, Ser. No. 503,991
Int. Cl.² C07H 5/06, 15/22
U.S. Cl. 260—210 AB 3 Claims

1. A member of the class consisting of O-2,6-diamino-2,3,4,6-tetradeoxy-α-D-erythro-hexopyranosyl-(1 → 4)-O-[5-amino-5-deoxy-β-D-xylofuranosyl-(1 → 5)]-N¹-[(S)-4-amino-2-hydroxy-1-oxobutyl]-2-deoxystreptamine and pharmaceutically acceptable salts thereof.

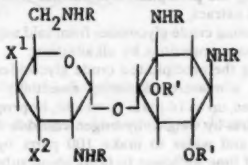
3,960,838

MERCAPTOPSEUDODISACCHARIDES

David J. Cooper, Downingtown; John R. E. Hoover, Glenside, both of Pa., and Jerry A. Weisbach, Cherry Hill, N.J., assignors to SmithKline Corporation, Philadelphia, Pa.

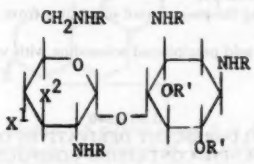
Filed Oct. 29, 1974, Ser. No. 518,428
Int. Cl.² C07H 15/00
U.S. Cl. 260—210 AB 16 Claims

1. A compound of the formula



A

or



B

where

X^1 and X^2 are each SR″ or OR″ but are not the same;

R is hydrogen or an amino protecting group;

R′ is hydrogen or a hydroxy protecting group; and

R″ is hydrogen or a mercapto protecting group.

3,960,839

PROCESS FOR RECOVERING AND ISOLATING SOLASODINE AND GLYCOSIDES THEREOF

Milton Guerrero, Quito, Ecuador, assignor to Escuela Politecnica Nacional, Quito, Ecuador

Continuation of Ser. No. 331,004, Feb. 9, 1973, abandoned.
This application June 4, 1974, Ser. No. 476,278
Int. Cl.² C07J 21/00
U.S. Cl. 260—210.5 30 Claims

1. A process of obtaining a solution of glycosides of solasodine comprising:

a. extracting in either the fresh or dried state the cut or broken fruit of a plant of the stellate Leptostemonum group with a mixture of water and an alcohol selected from the group consisting of methanol, ethanol, isopropanol, and mixtures thereof;

b. removing substantially all of the alcohol from the resulting aqueous-alcoholic extract by distillation;

c. adjusting the weight of the resulting aqueous extract so that the weight of the adjusted aqueous extract is at least about 0.2, if said fruit was dried before said extraction, or about 0.3, if said fuit was not dried before extraction, times the wet weight of said fruit; and

d. removing the precipitate from said adjusted aqueous extract.

10. A process for recovering and isolating solasodine comprising:

a. extracting in either the fresh or dried state the cut or broken fruit of a plant of the stellate Leptostemonum

group with a mixture of water and alcohol selected from the group consisting of methanol, ethanol, isopropanol, and mixtures thereof;

b. removing substantially all of the alcohol from the resulting aqueous-alcoholic extract by distillation;

c. adjusting the weight of the resulting aqueous extract so that the weight of the adjusted aqueous extract is not less than about 0.2, if said fruit was dried before extraction, or about 0.3, if said fruit was not dried before extraction, times the wet weight of said fruit;

d. removing the precipitated impurities from said adjusted aqueous extract;

e. precipitating crude glycosides from said adjusted aqueous extract sans impurities by alkalization;

f. removing the precipitated crude glycosides;

g. heating a mixture consisting essentially of said crude glycosides, up to 16 parts by weight, isopropanol about 55 to 72 parts by weight, hydrogen chloride 4 to 8 parts by weight, and water to make 100 parts by weight for a length of time sufficient to bring about substantially complete hydrolysis of the glycosides;

h. adding to said mixture concentrated aqueous alkali selected from the group consisting of sodium hydroxide, potassium hydroxide, sodium carbonate, and potassium carbonate until the pH of said mixture is between about 9 and about 10;

i. separating the precipitated solasodine from said alkalized mixture;

j. washing said precipitated solasodine with water.

3,960,840

FLUORESCENT DERIVATIVES OF ADENINE-CONTAINING COMPOUNDS

John A. Secrist, III, Cambridge, Mass.; Jorge R. Barrio; Nelson J. Leonard, both of Urbana, and Gregorio Weber, Urbana, all of Ill., assignors to University of Illinois Foundaton, Urbana, Ill.

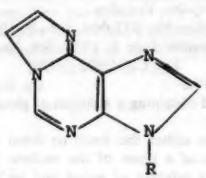
Filed Dec. 29, 1972, Ser. No. 319,744

Int. Cl.² C07H *19/16, 19/20*

U.S. Cl. 260—211.5 R **6 Claims**

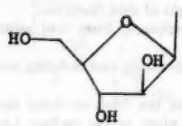
1. A biologically active coenzyme which is fluorescent within the visible spectrum, said coenzyme being selected from the group consisting of:

A. compounds having the formula

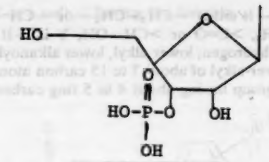


wherein R has any of the following formulas:

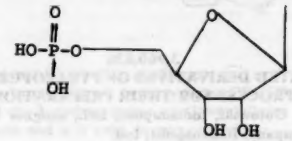
(1)



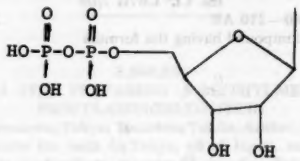
(2)



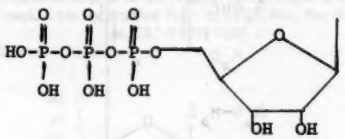
(3)



(4)



(5)



B. anhydrides of A(3) above with nicotinamide mononucleotide or flavin mononucleotide, and

C. salts of any of the compounds of Groups A(2)–A(5) or (B) above with inorganic bases.

3,960,841

3,17,18-TRIHYDROXY-1,3,5(10)-ESTRATRIENES

Klaus Engel; Klaus Prezewowsky; Henry Laurent, and Yukishige Nishino, all of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berin & Bergkamen, Germany

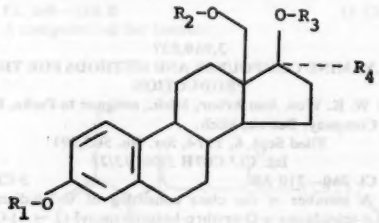
Filed July 12, 1974, Ser. No. 487,969

Claims priority, application Germany, July 13, 1973, 2336432

Int. Cl.² C07J *1/00*

U.S. Cl. 260—239.55 R **17 Claims**

1. A 3,17,18-trihydroxy-1,3,5(10)-estratriene or ester or ether thereof of the formula



wherein

R_1, R_2 and R_3 each are a hydrogen atom, hydrocarbon acyl of 1–15 carbon atoms, alkyl of 1–5 carbon atoms, cycloalkyl of 3–8 ring atoms or tetrahydropyranyl, and

R_4 is a monounsaturated aliphatic hydrocarbon of 1–6 carbon atoms.

3,960,842

PROCESS FOR THE PREPARATION OF 17β-OXALYL STEROIDS

Gregor Haffer; Ulrich Eder; Henry Laurent; Jürgen Ruppert; Gerhard Sauer, and Rudolf Wiechert, all of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin & Bergkamen, Germany

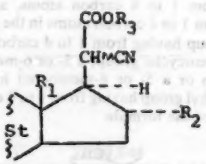
Filed July 12, 1974, Ser. No. 487,987

Claims priority, application Germany, July 14, 1973, 2336438

Int. Cl.² C07J 7/00

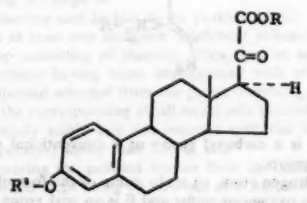
U.S. Cl. 260—239.55 C **17 Claims**

1. A process for the production of a 17β-oxalyl-17α-H steroid having as its 17-position substituent an oxalyl group of the formula —CO—COOR wherein R is H, alkyl of 1–8 carbon atoms or benzyl, having a 13-methyl or 13-ethyl group and whose 16-position is unsubstituted or substituted by α-CH_3, which comprises the steps of deprotonating in an aprotic solvent a corresponding 20-cyano-17α-H compound of the formula



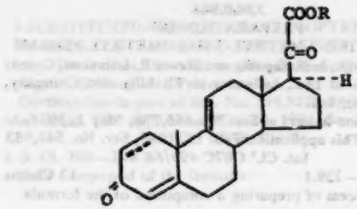
wherein R_1 is a methyl or ethyl, R_2 is a hydrogen atom or methyl, R_3 is a hydrogen atom, alkyl of 1–8 carbon atoms or benzyl, and St is the remainder of the steroid molecule, by reaction with an alkali metal, alkaline earth metal, copper(I) or thallium(I) deprotonating agent, and oxidatively slitting the deprotonated compound with oxygen.

7. A 3-oxy-1,3,5(10)-pregnatriene-21-oic acid of the formula



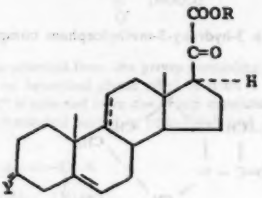
wherein R and R' each are alkyl of 1–8 carbon atoms.

8. A 3,20-dioxo-4-pregnen-21-oic acid alkyl ester of the formula



wherein R is alkyl of 1–8 carbon atoms and ⩵ is a single or double bond.

9. A 20-oxo-5-pregnen-21-oic acid alkyl ester of the formula



wherein R is alkyl of 1–8 carbon atoms, Y is β-OH,α-H, β-AcO,α-H wherein Ac is alkanoyl of 1–8 carbon atoms or benzoyl, or alkylenedioxy of 2–8 carbon atoms forming with the 3-position carbon atom a 5 or 6 membered ring, and ⩵ is a single or double bond.

3,960,843

PROCESS FOR THE PREPARATION OF ESTERS OF N-BLOCKED PENICILLIN ACIDS WHICH COMPRISES REACTING THE ACID OR A SALT THEREOF WITH A PRIMARY AMINE AND A NITROSATING AGENT

Alan Gibson Long, Greenford; Derek Walker, Windermere; David Thomas Eastlick, Scotforth, and Harry Carson Stables, Ulverston, all of England, assignors to Glaxo Laboratories Limited, Greenford, England

Filed July 9, 1973, Ser. No. 377,268

Int. Cl.² C07D 499/08, 501/02

U.S. Cl. 260—239.1 **6 Claims**

1. In a process for the preparation of an ester of an N-blocked amino acid, wherein said N-blocked amino acid is a penicillin, the improvement which comprises reacting an N-blocked penicillin acid, or a salt thereof formed from an alkali metal with an amine of the formla RNH_2, where R is a member selected from the group consisting of a C_{5-7} cycloalkyl, benzyl, diphenylmethyl, triphenylmethyl, fluoroenyl, xanthydryl, thienylmethyl and furylmethyl and such a group substituted by at least one of chloro, bromo, cyano, nitro, C_{1-4} alkyl, C_{1-4} alkoxy, C_{2-7} alkoxycarbonyl and C_{1-4} alkylsulphonyl, and a nitrosating agent selected from the group consisting of C_{2-7} alkanoyl nitrites, nitrosyl chloride, nitrosyl bromide, nitrosyl sulphate, nitrosyl hydroxide, nitrosyl sulphonate, nitrosyl borofluoride, nitrous acid, potassium nitrosyldisulphonate and C_{1-5} alkyl nitrites, to yield an N-blocked amino acid ester in which the ester group has the formula —COOR where R is as defined above.

3,960,844

PREPARATION OF 6-ACYLAMINO-2-METHYL-2-HALOMETHYL PENAMS

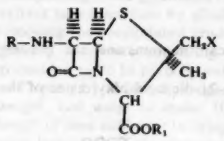
Stjepan Kukolja, Indianapolis, and Steven R. Lammert, Greenwood, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 465,778, May 1, 1974, abandoned. This application Feb. 11, 1975, Ser. No. 548,953

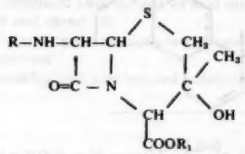
Int. Cl.² C07C *499/44*

U.S. Cl. 260—239.1 **13 Claims**

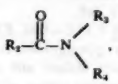
1. The process of preparing a compound of the formula



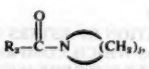
by reacting a 3-hydroxy-3-methylcepham compound of the formula



and at least 1 molar equivalent of a halogenating agent selected from the group consisting of $CO(X)_2$, $SO(X)_2$, and $P(X)_5$ in the presence of at least 1 molar equivalent (with respect to the halogenating agent) of a tertiary carboxamide selected from the group consisting of



and



and

at a temperature between about 50° and 120°C., wherein in the above formulae, R is C_2–C_8 alkanoyl, benzoyl or a group represented by the formula

$$P-(O)_n-(CH_2)_m\,C(O)-$$

wherein P is 2-thienyl, 3-thienyl, 2furyl, phenyl or phenyl substituted by C_1–C_3 alkyl, C_1–C_3 alkoxy, nitro, fluoro, chloro, bromo, iodo, cyano, or trifluoromethyl; *n* is 0 or 1, and *m* is 0, 1, 2, or 3; with the limitation that when *n* is 1, *m* is not 0, and P is phenyl or phenyl substituted by C_1–C_3 alkyl, C_1–C_3 alkoxy, nitro, fluoro, chloro, bromo, iodo, cyano, or trifluoromethyl;

R_1 is a conventional carboxylic acid protecting group; R_2 is hydrogen or C_1–C_4 alkyl, and each of R_3 and R_4 is independently C_1–C_4 alkyl, phenyl, tolyl or xylyl such that R_3 and R_4 together contain no more than 11 carbon atoms; R_5 is C_1–C_6 alkyl, phenyl, tolyl, or xylyl; *j* is an integer from 3 to 6 inclusive; *k* is an integer from 3 to 6 inclusive; and X is chlorine or bromine.

3,960,845

PROCESS FOR PREPARING 7β-ACYLAMINO-7α-ALKOXYCEPHALOSPORINS OR 6β-ACYLAMINO-6α-ALKOXYPENICILLINS

Tetsuo Hiraoka, and Yukio Sugimura, both of Tokyo, Japan, assignors to Sankyo Company Limited, Tokyo, Japan

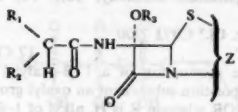
Filed Mar. 4, 1975, Ser. No. 555,195

Claims priority, application Japan, Mar. 22, 1974, 49-32391; Mar. 22, 1974, 49-32392; Apr. 8, 1974, 49-39730; Apr. 13, 1974, 49-41530

Int. Cl.² C07D *499/44, 501/20*

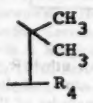
U.S. Cl. 260—239.1 **27 Claims**

1. A process for the preparation of a compound having the formula

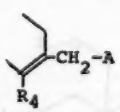


(I)

wherein R_1 is a hydrogen atom, a halogen atom, an alkyl group having from 1 to 4 carbon atoms, or an aryl group; R_2 is a hydrogen atom, a halogen atom, an alkyl group having from 1 to 4 carbon atoms, an aryl group, an alkylthio group having from 2 to 4 carbon atoms, an arylthio group, an azidoalkylthio group having from 1 to 4 carbon atoms, a cyanoalkylthio group having from 1 to 4 carbon atoms in the alkyl moiety, an alkylsulfonyl group having from 1 to 4 carbon atoms, a 5- or 6-membered heterocyclic group, a 5- or 6-membered heterocyclic oxy group or a 5- or 6-membered heterocyclic thio group; R_3 is an alkyl group having from 1 to 4 carbon atoms; Z is a fragment of the formula



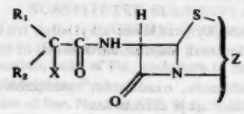
or



where R_4 is a carboxyl group or a conventional protected carboxyl group;

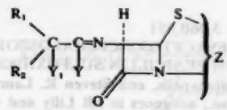
A is a hydrogen atom, an azido group or the formula -B-E in which B is oxygen or sulfur and E is an acyl group, an alkyl group having from 1 to 4 carbon atoms, optionally substituted-carbamoyl, -thiocarbamoyl or -heterocyclic group;

which comprises reacting an acylamino compound having the formula



(II)

wherein R_1, R_2 and Z are the same as above and X is a hydroxy group or a halogen atom with a halogenating agent to give a halogenoimine having the formula

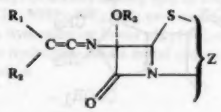


(III)

wherein R_1, R_2 and Z are the same as above and Y_1 and Y may be the same or different and each is a halogen atom, reacting the latter compound (III) with an equimolar amount of an alkali metal alkoxide having the formula

R_3OM (IV)

wherein R_3 is the same as above and M is an alkali metal in the presence of one equivalent amount of a base to give an alkoxyketeneimine having the formula



(V)

wherein R_1, R_2, R_3 and Z are the same as above and subjecting the later compound (V) to hydration.

3,960,846

METHOD FOR PURIFYING LACTAMS

Philippe Potin, and Michel Biensan, both of Billere, France, assignors to Ato Chimie, Courbevoie, France

Filed Sept. 20, 1974, Ser. No. 508,020

Claims priority, application France, Sept. 24, 1973, 73.34103

Int. Cl.² C07D 201/14

U.S. Cl. 260—239.3 A **21 Claims**

1. A method of purifying a lactam obtained by the Beckmann transposition of the corresponding alicyclic oximes, comprising the steps of:

a. contacting said lactam to be purified in the fused state with at least one inorganic adsorbent selected from the group consisting of alumina, silica, and an apatite, said adsorbent having been impregnated with at least one compound selected from the group consisting of an acid and the corresponding alkali metal salts thereof which are thermally stable and non-reactive with the lactam at a temperature lower than 250°C, and

b. separating the purified lactam from the adsorbent, the aforesaid steps being carried out at a temperature which is at least equal to the melting point of the lactam and said lactam is maintained in the fused state during the purification procedure.

21. A method according to claim 1 wherein said lactam to be purified is lauryl-lactam.

3,960,847

9-SUBSTITUTED-4-OXOPYRIDO(1,2-α)PYRIMIDINE-3-CARBOXYLIC ACIDS AND DERIVATIVES THEREOF

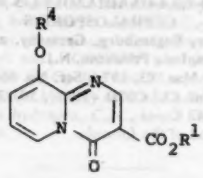
Harry Louis Yale, New Brunswick, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 244,955, April 17, 1972, abandoned. This application May 28, 1974, Ser. No. 473,637

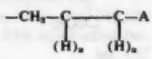
Int. Cl.² C07D 471/04

U.S. Cl. 260—240 K **15 Claims**

1. A compound of the formula:



wherein R^1 is selected from the group consisting of hydrogen and straight or branched chain alkyl of from 1 to 4 carbon atoms; and R^4 is selected from the group consisting of benzyl, phenethyl, substituted benzyl or phenethyl, and



wherein *n* is zero or one, ——— represents a triple bond ≡ when *n* is zero and a double bond = when *n* is one, A is hydrogen, phenyl, or substituted phenyl, and said phenyl, benzyl and phenethyl substituent is selected from the group consisting of mono (halogen), di(halogen), mono(carboethoxy), mono(trifluoromethyl), mono(alkyl) of 1 to 4 carbon atoms, mono(alkoxy) of 1 to 4 carbon atoms, and mono(NC); and a pharmaceutically acceptable salt thereof.

3,960,848

2-AMINOALKYL-3A,4,5,6,7,8-HEXAHYDRO-3-PHENYL-8-(PHENYLMETHYLENE)-CYCLOPENTA[C-]PYRAZOLES

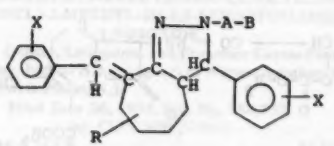
John Krapcho, Somerset, and Chester Frank Turk, Kendall Park, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 469,171, May 13, 1974, abandoned. This application June 30, 1975, Ser. No. 591,544

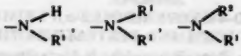
Int. Cl.² C07D 231/54

U.S. Cl. 260—240 F **6 Claims**

1. A compound of the formula:



wherein X is selected from the group consisting of hydrogen, chloro, fluoro, lower alkyl, lower alkoxy, and trifluoromethyl; R is selected from the group consisting of hydrogen and lower alkyl; A is straight or branched chain alkylene of 1 to 8 carbons; B is selected from the group consisting of $—NH_2$,



wherein R^1 is lower alkyl and R^2 is phenyl or phenyl-lower alkyl; and an acid addition or quaternary salt or N-oxide thereof.

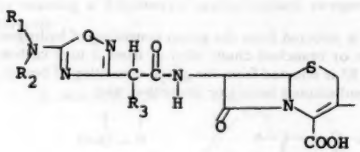
3,960,849

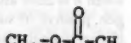
AMINO-1,2,4-OXADIAZOLYL-3-ACETYL CEPHALOSPORINS

Hermann Breuer, Regensburg, Germany, assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Mar. 13, 1974, Ser. No. 450,928
Int. Cl.² C07D *499/44, 501/20*
U.S. Cl. 260—243 C **5 Claims**

1. A compound of the formula:





wherein R_1 and R_2 are independently selected from the group consisting of hydrogen and methyl; R_3 is phenyl or 2-thienyl; or a physiologically acceptable salt thereof.

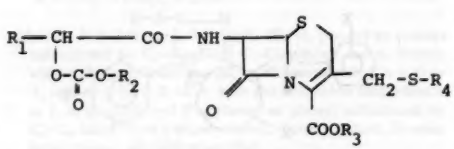
3,960,850

3-HETEROTHIO DERIVATIVES OF [(ALKOXYCARBONYL)OXYACETYL]CEPHALOSPORINS

Uwe D. Treuner, and Hermann Breuer, both of Regensburg, Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed May 10, 1974, Ser. No. 468,716
Int. Cl.² C07D *501/20*
U.S. Cl. 260—243 C **9 Claims**

1. A compound of the formula



wherein

R_1 is phenyl or pyridyl;
R_2 is lower alkyl;
R_3 is hydrogen, lower alkyl, tri(lower alkyl)silyl, tri(lower alkyl)stannyl, alkali metal, alkaline earth metal or (lower alkyl)amine;
R_4 is isoxazole, isothiazole, oxadiazole, thiadiazole, tetrazole and their lower alkyl derivatives.

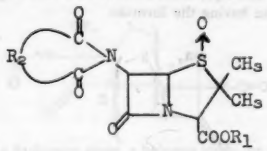
3,960,851

PREPARATION OF DESACETOXY-CEPHALOSPORIN SULFOXIDES FROM PENICILLIN SULFOXIDES

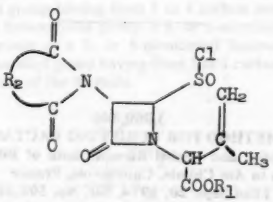
Stjephan P. Kukolja, Indianapolis, and Steven R. Lammert, Greenwood, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 253,385, May 15, 1972, Pat. No. 3,843,682. This application July 11, 1974, Ser. No. 487,681
Int. Cl.² C07D *501/10*
U.S. Cl. 260—243 C **6 Claims**

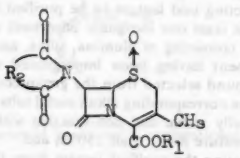
1. A process for preparing a desacetoxycephalosporin sulfoxide which comprises reacting a penicillin sulfoxide having the formula



with from about 0.9 to about 1.5 moles of sulfuryl chloride per mole of the penicillin sulfoxide at a temperature of from about 75°C. to about 120°C. to produce a sulfinyl chloride having the formula



and reacting the resulting sulfinyl chloride with at least an equimolar amount of a tertiary amine containing alkyl groups having from 1 to 5 carbon atoms each to produce a desacetoxycephalosporin sulfoxide having the formula



in which, in the above formulae,

R_1 is the residue of an ester group which is removable by hydrogenation or acid treatment; and
R_2 is the residue of an imide derived from a dicarboxylic acid.

3,960,852
SUBSTITUTED SULFONYLACETAMIDO CEPHALOSPORINS

Robert M. De Marinis, King of Prussia, and John R. E. Hoover, Glenside, both of Pa., assignors to SmithKline Corporation, Philadelphia, Pa.

Division of Ser. No. 249,858, May 3, 1972, Pat. No. 3,865,819. This application Dec. 3, 1974, Ser. No. 529,162
Int. Cl.² C07D *501/50*
U.S. Cl. 260—243 C **5 Claims**

1. A compound of the structure:

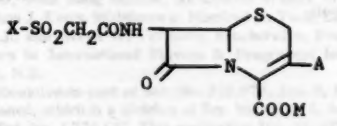
where:
X is CF_3;
A is CH_2S-Het;
Het is tetrazolyl, thiadiazolyl, triazolyl, oxadiazolyl, pyrimidyl, pyrazinyl or pyridyl, unsubstituted or substituted with one or two groups selected from the group consisting of lower alkyl, cycloalkyl, or alkenyl, each having one to four carbon atoms; lower alkoxy or alkoxyalkyl, each alkyl or alkoxy having one to four carbon atoms; hydroxy; CF_3; NHR; NR_2; SR; or bromine;
R is hydrogen or lower alkyl (C_1–C_4); and
M is hydrogen, alkali metal cation, or nontoxic ammonium cation.

3,960,853
SUBSTITUTED SULFONYLACETAMIDO CEPHALOSPORINS

Robert M. De Marinis, King of Prussia, and John R. E. Hoover, Glenside, both of Pa., assignors to SmithKline Corporation, Philadelphia, Pa.

Division of Ser. No. 249,858, May 3, 1972, Pat. No. 3,865,819. This application Dec. 3, 1974, Ser. No. 529,165
Int. Cl.² C07D *501/50*
U.S. Cl. 260—243 C **5 Claims**

1. A compound of the structure:



where:
X is phenyl;
A is CH_2S-Het;
Het is tetrazolyl, thiadiazolyl, triazolyl, oxadiazolyl, pyrimidyl, pyrazinyl or pyridyl, unsubstituted or substituted with one or two groups selected from the group consisting of lower alkyl, cycloalkyl, or alkenyl, each having one to four carbon atoms; lower alkoxy or alkoxyalkyl, each alkyl or alkoxy having one to four carbon atoms; hydroxy; CF_3; NHR; NR_2; SR; or bromine;
R is hydrogen or lower alkyl (C_1–C_4); and
M is hydrogen, alkali metal cation, or nontoxic ammonium cation.

3,960,854
7-MERCAPTO(OR THIO)-BENZOTHIADIAZINE PRODUCTS

Frederick C. Novello, Berwyn, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 236,244, March 20, 1972, Pat. No. 3,892,738. This application Dec. 19, 1974, Ser. No. 534,404
Int. Cl.² C07D *285/22*
U.S. Cl. 260—243 D **7 Claims**

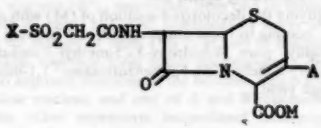
1. A 3-R^1-6-X-7-RS-1,2,4-benzothiadiazine-1,1-dioxide and pharmacologically acceptable salts thereof wherein X represents C_1–C_3 alkyl, chloro and trifluoromethyl; R^1 represents hydrogen, C_1–C_5 lower alkyl, monohalo-C_1–C_5 lower alkyl, dihalo-C_1–C_5-lower alkyl, phenyl-C_1–C_5-lower alkyl, —CO_2-C_1–C_5-lower alkyl and —$CONR^2R^3$ wherein R^2 represents hydrogen and lower C_1–C_5-alkyl and R^3 represents hydrogen, lower-C_1–C_5-alkyl and hydroxy substituted-C_1–C_5-lower alkyl; and R represents hydrogen, C_1–C_5-lower alkyl and phenyl-C_1–C_5-lower alkyl.

3,960,855
SUBSTITUTED SULFONYLACETAMIDO CEPHALOSPORINS

Robert M. De Marinis, King of Prussia, and John R. E. Hoover, Glenside, both of Pa., assignors to SmithKline Corporation, Philadelphia, Pa.

Division of Ser. No. 249,858, May 3, 1972, Pat. No. 3,865,819. This application Dec. 3, 1974, Ser. No. 529,161
Int. Cl.² C07D *501/50*
U.S. Cl. 260—243 C **7 Claims**

1. A compound of the structure:



where:
X is NH_2, or mono or dialkylamino, each alkyl from C_1–C_4;
A is CH_2S-Het;
Het is tetrazolyl, thiadiazolyl, triazolyl, oxadiazolyl, pyrimidyl, pyrazinyl or pyridyl, unsubstituted or substituted with one or two groups selected from the group consisting of lower alkyl, cycloalkyl, or alkenyl, each having one to four carbon atoms; lower alkoxy or alkoxyalkyl, each alkyl or alkoxy having one to four carbon atoms; hydroxy; CF_3; NHR; NR_2; SR; or bromine;
R is hydrogen or lower alkyl (C_1–C_4); and
M is hydrogen, alkali metal cation, or nontoxic ammonium cation.

3,960,856
PROCESS FOR THE PREPARATION OF 4-HYDROXY-3-(5-METHYL-3-ISOXAZOLYLCARBAMOYL)-2-METHYL-2H-1,2-BENZOTHIAZINE 1,1-DIOXIDE

Jerome D. Genzer, Livingston, and Francisco Carrio Fontsere, Pasippany, both of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed June 20, 1975, Ser. No. 588,752
Int. Cl.² C07D *279/02*
U.S. Cl. 260—243 R **14 Claims**

1. An improved process for preparing 4-hydroxy-3-(5-methyl-3-isoxazolylcarbamoyl)-2-methyl-2H-1,2-benzothiazine 1,1-dioxide (I) which comprises the following steps:
A. suspending more than two but less than six moles of an alkali metal alkoxide of a lower alcohol in dimethylformamide;

B. dissolving one mole of alkyl 2,3-dihydro-3-oxo-1,2-benzisothiazole-2-acetate 1,1-dioxide (II) in dimethylformamide;

C. combining the suspension of (A) and the solution of (B) rapidly, with stirring, while maintaining the internal reaction temperature at from about 15° to about 30°C.;

D. continuing the stirring of the reaction mixture of (C) and then acidifying, with the total time from initial reactant combination to acidification being from about 20 minutes to about 60 minutes;

E. precipitating from (D) substantially pure alkyl 4-hydroxy-2H-1,2-benzothiazine-3-carboxylate 1,1-dioxide (III) in high yield without recrystallization;

F. methylating the precipitate of (E) on the sulfonamide nitrogen;

G. refluxing the alkyl 4-hydroxy-2-methyl-2H-1,2-benzothiazine-3-carboxylate 1,1-dioxide (IV) obtained in (F) with 3-amino-5-methylisoxazole in an inert solvent to obtain crude 4-hydroxy-3-(5-methyl-3-isoxazolylcarbamoyl)-2-methyl-2H-1,2-benzothiazine 1,1-dioxide (I);

H. forming a slurry of crude compound I in an organic solvent;

I. stirring the slurry at room temperature for at least 15 minutes;

J. filtering the slurry of (I) and washing the filter cake obtained with water to remove the solvent;

K. suspending the solid cake of (J) in an excess of water and adding a sufficient amount of dilute alkali metal or alkaline earth metal hydroxide to form a solution;

L. adding a charcoal decolorizing agent to (K) and heating to below the boiling point of the solution for a sufficient time to achieve decolorization;

M. filtering the heated solution of (L) to remove the charcoal decolorizing agent; and

N. acidifying the decolorized solution of (M) with a mineral acid, cooling to room temperature, and filtering out substantially pure 4-hydroxy-3-(5-methyl-3-isoxazolylcarbamoyl)-2-methyl-2H-1,2-benzothiazine 1,1-dioxide (I) in high yield.

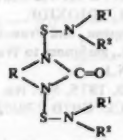
3,960,857

UREA ADDITIVES FOR SULFUR VULCANIZABLE POLYMERS

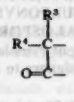
John P. Lawrence, Stow, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed June 26, 1972, Ser. No. 266,040
Int. Cl.² C07D 413/14
U.S. Cl. 260—246 B **5 Claims**

1. A urea having the following structural formula



wherein R is selected from the group consisting of saturated and olefinic divalent aliphatic radicals having 1 to 7 carbon atoms, saturated and olefinic divalent cyclic aliphatic radicals having 5 to 7 carbon atoms, arylene radicals having 6 to 10 carbon atoms and the radical



which together with the

radical forms a hydantoin ring wherein R^3 and R^4 are selected from the group consisting of hydrogen, alkyl radicals having 1 to 4 carbon atoms, cycloalkyl radicals having 5 to 6 carbon atoms, aralkyl radicals having 7 to 10 carbon atoms and aryl radicals having 6 to 10 carbon atoms or R^3 and R^4 can be joined to form with the attached carbon atom a hydrocarbon ring containing 5 to 6 carbon atoms, and wherein R^1 and R^2 are selected from the group consisting of alkyl radicals having 1 to 20 carbon atoms, cyanoalkyl radicals having 2 to 21 carbon atoms, cycloalkyl radicals having 5 to 20 carbon atoms, aralkyl radicals having 7 to 20 carbon atoms and aryl radicals having 6 to 20 carbon atoms and wherein R^1 and R^2 can be joined through a member of the group consisting of -CH_2- and, -O-, to constitute with the attached nitrogen atom a heterocyclic ring.

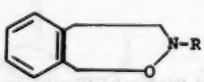
3,960,858

3-HETERO ACYL-2,3-BENZOXAZEPINES

Giorgio Pifferi, Milan; Amedeo Omodei-Sale', Pavia, and Pietro Consonni, Milan, all of Italy, assignors to Gruppo Lepetit S.p.A., Milan, Italy

Continuation-in-part of Ser. No. 236,222, March 20, 1972, abandoned. This application Nov. 14, 1974, Ser. No. 523,789
Int. Cl.² C07D 413/06
U.S. Cl. 260—247.2 B **6 Claims**

1. A 1,3,4,5-tetrahydro-2,3-benzoxazepine represented by the formula



wherein R represents 1-pyrrolidinylcarbonyl, 4-morpholinylcarbonyl, 4-methyl-1-piperazinylcarbonyl, 4-phenyl-1-piperazinylcarbonyl or 4-phenyl-1-piperazinylacetyl.

3,960,859

21-DEOXYDIHYDROAJMALINE DERIVATIVES

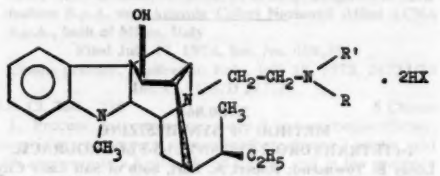
Klaus Braun; Günther Gabsch, both of Radebeul; Werner Förster, Halle; Rolf Ertel, Dresden, and Klaus Femmer, Radebeul, all of Germany, assignors to VEB Arzneimittelwerk Dresden, Radebeul, Germany

Continuation of Ser. No. 373,557, June 25, 1973, abandoned, which is a continuation of Ser. No. 90,472, Nov. 17, 1970, abandoned. This application Mar. 20, 1975, Ser. No. 560,270

Int. Cl.² C07D *471/08*

U.S. Cl. 260—247.5 FP 10 Claims

1. A 21-deoxydihydroajmaline derivative having the formula



. 2HX

wherein R and R′ are each the same ethyl, isopropyl or isobutyl group or R and R′ together with the N atom with which they are associated form a morpholino, piperidino or pyrrolidino ring; X is the anion of a physiologically acceptable inorganic or organic acid.

3,960,860

2-METHYL-5,7-DIHYDROTHIENO-[3,4d]-PYRIMIDINE

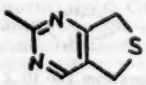
Ira Katz, West Long Branch; Richard A. Wilson, Westfield; William J. Evers, Middletown; Manfred H. Vock, Locust, all of N.J., and Gerrit W. Verhoeve, Feucherolles, France, assignors to International Flavors & Fragrances Inc., New York, N.Y.

Continuation-in-part of Ser. No. 321,973, Jan. 8, 1973, abandoned, which is a division of Ser. No. 66,110, Aug. 21, 1970, Pat. No. 3,726,692. This application Jan. 15, 1975, Ser. No. 541,259

Int. Cl.² C07D *495/04*

U.S. Cl. 260—251 A 1 Claim

1. 2-methyl-5,7-dihydrothieno-(3,4d)-pyrimidine having the structure:



3,960,861

2 (OR 4) AMINO 4 (OR 2) N-HETERO QUINAZOLINES

John Christopher Danilewicz, Ash; John Edward Glyn Kemp, Canterbury, and James Robert Wright, Deal, all of England, assignors to Pfizer Inc., New York, N.Y.

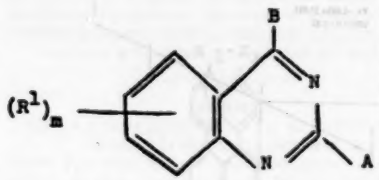
Filed Sept. 5, 1973, Ser. No. 394,491

Claims priority, application United Kingdom, Sept. 9, 1972, 41992/72

Int. Cl.² C07D *239/95*

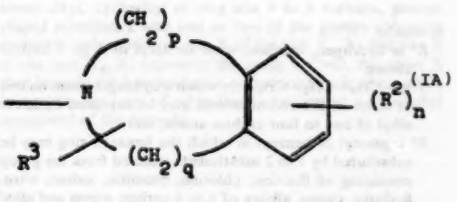
U.S. Cl. 260—256.4 Q 20 Claims

1. A compound of the formula:



(I)

and the pharmaceutically-acceptiable acid addition salts thereof, wherein $(R^1)_m$ represents from one to three substituents, each R^1 being hydroxyl, benzyloxy or lower alkoxy and *m* being an integer of from 1 to 3, or two of the moieties R^1 when taken together form lower alkylenedioxy directly attached to adjacent positions of the benzene-ring portion of the quinazoline nucleus; and one of A and B represents amino, while the other represents benzo-fused heterocyclic ring moiety of the formula:



(IA)

wherein $(R^2)_n$ represents from one to three substituents, each R^2 being hydroxyl, lower alkoxy, lower alkenoxy, phenoxy, pyridyloxy, amino, lower alkanoamido, benzenesulfonamido, furoamido or lower alkoxycarbonylamino, *n* being an integer of from 1 to 3, with the proviso that *n* can only be 1 when R^2 is amino, lower alkanoamido, benzenesulfonamido, furoamido or lower alkoxycarbonylamino; two of the moieties R^2 when taken together form lower alkylenedioxy directly attached to adjacent positions of the benzene-ring portion of the benzo-fused heterocyclic ring moiety; R^3 is hydrogen or lower alkyl directly attached to any one of the substitutable carbon atoms of the heterocyclic portion of the benzo-fused heterocyclic ring moiety; and p and q are each 0 to 3 with the proviso that p plus q equals 3.

3,960,862
1,3-DIAZACYCLOALKENO-[1,2,D]-BENZO-[F-]-1,3,4-THIADIAZEPINES

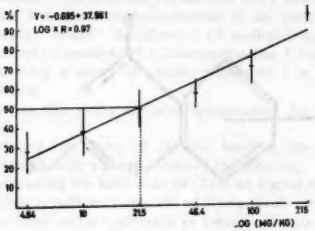
Helmut Hagen, Frankenthal, and Juergen Niemeyer, Gruenstadt, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Sept. 23, 1974, Ser. No. 508,579

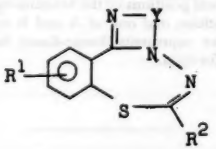
Claims priority, application Germany, Sept. 29, 1973, 2349064

Int. Cl.² C07D *239/00*

U.S. Cl. 260—256.5 R **6 Claims**



1. A compound of the formula (I)



in which:

R^1 is hydrogen, halogen, nitro or alkyl of 1 to 7 carbon atoms;

Y is $-CH_2-CH_2-CH_2-$ in which a hydrogen atom on one or more of the carbon atoms may be replaced by lower alkyl of one to four carbon atoms; and

R^2 is phenyl or benzoyl in which the benzene ring may be substituted by 1 to 2 substituents selected from the group consisting of fluorine, chlorine, bromine, iodine, nitro, hydroxy, cyano, alkoxy of 1 to 4 carbon atoms and alkyl of 1 to 4 carbon atoms,

or an acid addition salt of said compound.

3,960,863
PYRIDO [1,2-a]PYRIMIDINONE DERIVATIVES

Yasunobu Sato; Hiroshi Fujita; Takagi, and Katsuo Kamoshita, all of Tokyo, Japan, assignors to Sankyo Company Limited, Tokyo, Japan

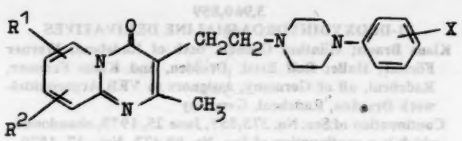
Filed June 5, 1975, Ser. No. 583,864

Claims priority, application Japan, June 25, 1974, 49-72549; June 25, 1974, 49-72550

Int. Cl.² C07D *471/04*

U.S. Cl. 260—256.4 F **8 Claims**

1. Pyrido[1,2-a]pyrimidinone derivative having the formula



wherein R^1 and R^2 may be the same or different and each represents a hydrogen atom, an alkyl group having from 1 to 4 carbon atoms or a halogen atom and X represents a hydrogen atom, an alkyl group having from 1 to 4 carbon atoms, an alkoxy group having from 1 to 4 carbon atoms, trifluoromethyl group or a halogen atom and a pharmaceutically acceptable acid addition salt thereof.

3,960,864
METHOD OF SYNTHESIZING 1-(TETRAHYDRO-2-FURANYL)-5-FLUOROURACIL

Leroy B. Townsend; Robert A. Earl, both of Salt Lake City, and Steven J. Manning, Bountiful, all of Utah, assignors to The University of Utah, Salt Lake City, Utah

Filed May 6, 1974, Ser. No. 467,538

Int. Cl.² C07D *239/54*

U.S. Cl. 260—260 **8 Claims**

1. An improved method for synthesizing 1-(tetrahydro-2-furanyl-5-fluorouracil comprising the steps of:

reacting a solution of the bis-trimethylsilyl derivative of 5-fluorouracil with 2-chlorotetrahydrofuran in a reaction vessel in the presence of a solvent comprising methylene chloride and 4 A molecular sieves;

removing water and HCl from the reaction solution with the molecular sieves and thereafter removing the molecular sieves from the reaction solution;

precipitating 1-(tetrahydro-2-furanyl)-5-fluorouracil from the solution by suitably maintaining the pH of the solution above at least 7.5;

separating the precipitate from the solution; and

concentrating and purifying the precipitate.

3,960,865
MONO OR BIS 3-(POLYPROPYL OR BUTYL-PROPENYL)-AMINO ALKYL PIPERAZINES

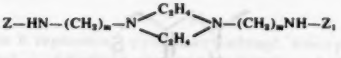
George S. Culbertson, Downers Grove, Ill., assignor to Standard Oil Company, Chicago, Ill.

Division of Ser. No. 391,590, Aug. 27, 1973, which is a continuation-in-part of Ser. No. 116,722, Feb. 11, 1971, abandoned. This application Apr. 17, 1975, Ser. No. 568,848

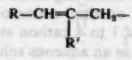
Int. Cl.² C07D *295/12*

U.S. Cl. 260—268 PL **3 Claims**

1. An N-hydrocarbyl-substituted bis-(aminoalkyl) piperazine product having the formula



wherein *m* is an integer from 1 to 10, Z is



wherein R' is hydrogen or methyl and R consists of propyl or butyl units and the total carbon content of Z is in the range from about 25 to about 180 carbon atoms and wherein Z_1 is hydrogen or Z.

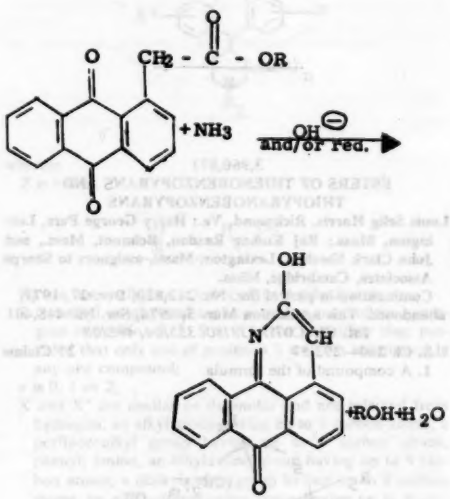
3,960,866

PROCESS FOR PREPARING 1-AZA-2-HYDROXYBENZANTHRONE

Giuseppe Ribaldone, Gallarate; Giampiero Borsotti, Novara, and Franco Gonzati, Saronno, all of Italy, assignors to Montedison S.p.A. and Aziende Colori Nazionali Affini ACNA S.p.A., both of Milan, Italy

Filed July 17, 1974, Ser. No. 489,351
Claims priority, application Italy, July 18, 1973, 26722/73
Int. Cl.² C07D 217/24
U.S. Cl. 260—278 5 Claims

1. Process for preparing 1-aza-2-hydroxybenzanthrone, comprising reacting an ester of anthraquinone-1-acetic acid with ammonia in a hydroxylated solvent and in the presence of at least the stoichiometric amount of a strong base and/or of a catalytic amount of a reducing substance, according to the scheme:



wherein: R = Cl –C_8 alkyl, and "red." means reducing agent,

the hydroxylated solvent being selected from the group consisting of water, methanol, ethanol, isobutanol and ethylene glycol; the strong base being selected from the group consisting of NAOH, KOH, $Ba(OH)_2$, Na_2O, CH_3ONa, and CH_3OK; the reducing substance being selected from the group consisting of sodium hydrosulphite, formaldehyde, sodium sulphoxylate, zinc, iron, aluminum and tin; and the reaction being carried out at a temperature comprised between 20° and 80°C.

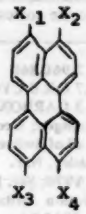
3,960,867

METHOD OF PRODUCING PERYLENETETRACARBOXYLIC ACID DERIVATIVES

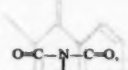
Nikolai Stepanovich Dokunikhin, Presnensky val, 42, kv. 23, and Georgy Nikolaevich Vorozhtsov, Sadovaya-Spasskaya ulitsa, 21, kv. 268, both of Moscow, U.S.S.R.

Division of Ser. No. 246,521, April 24, 1972, Pat. No. 3,959,285. This application Dec. 17, 1973, Ser. No. 425,547
Claims priority, application U.S.S.R., Apr. 28, 1971, 1646220; Feb. 9, 1971, 1614455
Int. Cl.² C07D 471/06
U.S. Cl. 260—281 P 10 Claims

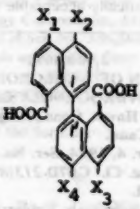
1. A method of producing a perylenetetra-carboxylic acid derivative of the formula:



where X_1, X_2 and X_3, X_4 represents the group,



wherein R is selected from the group consisting of hydrogen, lower alkyl, cycloalkyl of ring size 4 to 8 carbons, phenyl, phenyl substituted with one or two of the groups chloro or methoxy, and pyridyl; or one X of the pair X_1, X_2 and one X of the pair X_3, X_4 represent the group —C=O, the other X then being in the benzimidazole or perinone cycle, the method comprising the steps of subjecting to cyclization a dinaphthyl compound of the formula:



wherein X_1, X_2 and X_3, X_4 represent the group

wherein R is selected from the group consisting of hydrogen, lower alkyl, cycloalkyl of ring size 4 to 8 carbons, phenyl, phenyl substituted with one or two of the groups chloro or methoxy, and pyridyl; or one X of the pair X_1, X_2 and one X of the pair X_3, X_4 represent the group $-C=O$, the other X then being in the benzimidazole or perinone cycle, said dinaphthyl compound being either symmetrical or non-symmetrical with respect to the 1, 1′ bond, by treating said dinaphthyl compound with a reducing agent selected from the group consisting of hydrosulphite, Rongalite and other reducing agents capable of reducing vat dyes to leuco compounds in an aqueous alkaline medium, followed by oxidation with an oxidant selected from the group consisting of atmospheric oxygen, solutions of hydrogen peroxide, $Na_2Cr_2O_7$ or $K_2Cr_2O_7$, and other oxidants capable of oxidizing the leuco compounds of vat dyes to the corresponding vat dyes.

3,960,868

DERIVATIVES OF 6,7 OR 8 CYCLOALKYL 4-OXO QUINOLINE 3 CARBOXYLIC ACID

Pier Giorgio Ferrini, Binningen; Georges Haas, and Alberto Rossi, both of Oberwil, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

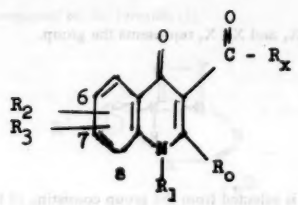
Filed May 6, 1974, Ser. No. 467,166

Claims priority, application Switzerland, May 11, 1973, 6722/73; Mar. 21, 1974, 3935/74

Int. Cl.² C07D *215/56*

U.S. Cl. 260—287 AN **11 Claims**

1. A product of the formula



wherein R_a denotes hydrogen or hydroxy, R_1 denotes hydrogen, alkyl, aklenyl or phenyl-alkyl having up to 8 carbon atoms R_2 is bound in the positions 6, 7 or 8 of the quinoline moiety and represents cycloalkyl or cycloalkenyl with 5–8 ring members, or 1-adamantyl, R_3 denotes lower alkyl, halogen or hydrogen and R_x denotes hydroxy, alkoxy with up to 8 carbon atoms, amino, N-mono-lower alkylamino, N,N-di-lower alkylamino or anilino, wherein the term "lower" denotes said moieties having up to 4 carbon atoms; or a tautomeric form thereof, or a therapeutically acceptable salt thereof.

3,960,869

PREPARATION OF 2-CHLOROPYRIDINE BY HYDROGENOLYSIS

Roland R. Kyi, North Haven, Conn., assignor to Olin Corporation, New Haven, Conn.

Filed Mar. 4, 1974, Ser. No. 447,611

Int. Cl.² C07D *213/89*

U.S. Cl. 260—290 HL **8 Claims**

1. A process for preparing 2-chloropyridine comprising reacting hydrogen with 2,6-dichloropyridine at a temperature at −10° to 100°C by feeding hydrogen into a solution of said 2,6-dichloropyridine at least partially dissolved in a solvent selected from the group consisting of benzene, xylene, toluene, carbon tetrachloride and pyridine in the presence of at least 0.1 part by weight per part by weight 2,6-dichloropyridine of a base selected from the group consisting of an alkali or alkaline earth metal hydroxide and an alkyl amine of the formula R_xNH_{3-x} wherein R is alkyl of 1 to 4 carbon atoms, and x is 1–3, said base being provided as an aqueous solution having a concentration of up to about 75 percent by weight of said base and in the presence of a catalytic amount of a transition metal catalyst selected from the group consisting of palladium, platinum and nickel.

3,960,870

ALKANESULFONIC ACID SALTS OF DECININE

Dale W. Blackburn, Moorestown, N.J., and Henry Cecil Caldwell, Ambler, Pa., assignors to SmithKline Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 351,702, April 16, 1973, abandoned. This application Aug. 2, 1974, Ser. No. 494,142

Int. Cl.² C07D *221/18*

U.S. Cl. 260—293.53 **4 Claims**

1. An alkanesulfonate salt of decinine of the formula:

$$(\text{decinine})_a \cdot RCH_aSO_3H$$

in which:

n is 1 and R is H or CH_3 or

n is 2 and R is SO_3H or CH_2SO_3H.

3,960,871

ESTERS OF THIENOBENZOPYRANS AND THIOPYRANOBENZOPYRANS

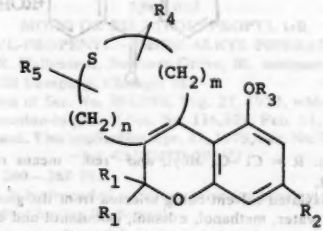
Louis Selig Harris, Richmond, Va.; Harry George Pars, Lexington, Mass.; Raj Kumar Razdan, Belmont, Mass., and John Clark Sheehan, Lexington, Mass., assignors to Sharps Associates, Cambridge, Mass.

Continuation-in-part of Ser. No. 212,820, Dec. 27, 1971, abandoned. This application Mar. 5, 1974, Ser. No. 448,401

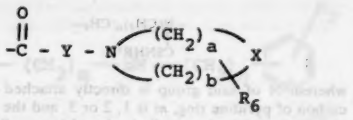
Int. Cl.² C07D *333/50, 335/04, 495/08*

U.S. Cl. 260—293.57 **27 Claims**

1. A compound of the formula



wherein n is 0 to 3, and m is 0 to 3 and $m + n = 2$ or 3, R_1 is lower alkyl, R_2 is a C_1 to C_{20} alkyl or a C_3 to C_8 cycloalkyl- C_1 to C_6 loweralkyl, R_4 is hydrogen or lower alkyl, R_5 is hydrogen or lower alkyl, and R_3 is



wherein Y is a straight or branched chain C_1 to C_8 alkylene, R_6 is hydrogen or lower alkyl, *a* is an integer from 1 to 4, *b* is an integer from 1 to 4, X is CH_2, S or NR_7 wherein R_7 is hydrogen or lower alkyl, with the limitation that when X is S or NR_7, a and b each must be 2; or a pharmaceutically acceptable acid addition salt thereof.

3,960,872

1 ALKYL-4-(10:OXO OR HYDROXY-10,11-DIHYDRO-5H-DIBENZO[a,d]CYCLOHEPTEN-5-YLIDENE)-PIPERIDINE COMPOUNDS

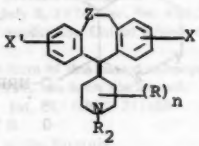
John D. Prugh, Lansdale, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 9,049, Feb. 5, 1970, abandoned, and a continuation-in-part of Ser. No. 4,123, Jan. 19, 1970, abandoned. This application Aug. 14, 1972, Ser. No. 280,685

Int. Cl.² C07D *211/32*

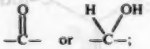
U.S. Cl. 260—293.62 **5 Claims**

1. A 10-oxygenated 10,11-dihydro-5H-dibenzo[a,d]-cycloheptene compound of the formula



wherein

Z is either



R_2 is a lower alkyl or a lower alkenyl substituent;

R is methyl or ethyl and replaces one or more of the hydrogens in position 2, 3, 5 or 6 of the piperidine ring, provided that only one of positions 3 and 5 is substituted in any one compound;

n is 0, 1 or 2;

X and X′ are similar or dissimilar and are selected from hydrogen, an alkyl group having up to 6 carbon atoms, a perfluoroalkyl group having up to 4 carbon atoms, phenyl, amino, an alkylamino group having up to 4 carbon atoms, a dialkylamino group having up to 8 carbon atoms, an alkylsulfonylamino group having up to 4 carbon atoms, halogen (fluorine, chlorine, bromine or iodine), hydroxyl, an alkoxy group having up to 4 carbon atoms, a perfluoroalkoxyl group having up to 4 carbon atoms, cyano, carboxy, carbamoyl, an alkylcarbamoyl group having up to 5 carbon atoms, a dialkylcarbamoyl group having up to 9 carbon atoms, a carbalkoxy group having up to 6 carbon atoms, mercapto, an alkylmercapto group having up to 4 carbon atoms, a perfluoroalkylmercapto group having up to 4 carbon atoms, an alkylsulfonyl group having up to 4 carbon atoms, a perfluoroalkylsulfonyl group having up to 4 carbon atoms, sulfamoyl, an alkylsulfamoyl group having up to 4 carbon atoms, or a dialkylsulfamoyl group having up to 8 carbon atoms.

3,960,873

1-PHENYLTHIOPROPYL-4-HYDROXY-4-PHENYL PIPERIDINES

Isamu Maruyama, Minoo; Hisao Yamamoto, Nishinomiya; Masaru Nakao, Toyonaka; Shigeru Sakai, Toyonaka; Kikuo Sasajima, Toyonaka; Sumio Kitagawa, Moriguchi, and Shigeho Inaba, Takarasuka, all of Japan, assignors to Sumitomo Chemical Co., Ltd., Osaka, Japan

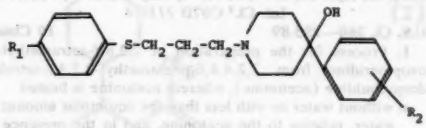
Division of Ser. No. 145,065, May 19, 1971, Pat. No. 3,845,057. This application June 21, 1974, Ser. No. 481,796

Claims priority, application Japan, May 20, 1970, 45-43555; May 20, 1970, 45-43556; May 22, 1970, 45-44303; May 23, 1970, 45-44289; May 29, 1970, 45-46668; June 15, 1970, 45-52254; June 18, 1970, 45-53276; June 26, 1970, 45-56305; June 29, 1970, 45-57541; July 6, 1970, 45-59300; July 17, 1970, 45-63091

Int. Cl.² C07D *211/52*

U.S. Cl. 260—293.73 **3 Claims**

1. A compound of the formula,



wherein R_1 is halogen and R_2 is hydrogen, halogen, nitro, trifluoromethyl, C_1-C_7 alkoxy or C_1-C_7 alkyl, or its non-toxic, pharmaceutically acceptable salt.

3,960,874

2-PHENOXY-ALKANOIC ACIDS

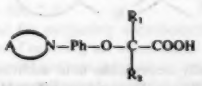
Richard William James Carney, New Providence, N.J., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 336,668, Feb. 28, 1973, Pat. No. 3,895,032. This application June 20, 1974, Ser. No. 481,281

Int. Cl.² C07D *295/14*

U.S. Cl. 260—293.82 **8 Claims**

1. A compound of the formula



in which each of R_1 and R_2 is hydrogen or lower alkyl, pH is unsubstituted phenylene or phenylene substituted by one or two members of the group consisting of lower alkyl, lower alkoxy, halogeno, trifluoromethyl or nitro and

is 5 to 7-ring-membered lower alkyleneimino or a lower alkyl ester, (lower alkoxy, di-lower alkylamino or lower alkyleneimino)-lower alkyl ester or a therapeutically useful ammonium, alkali metal, alkaline earth metal, aluminum or acid addition salt thereof.

3,960,875
PROCESS FOR THE PREPARATION OF 2,2,6,6-TETRAMETHYL-4-OXOPIPERIDINE

Ivan Orban, Basel; Hanns Lind, Liestal; Heimo Brunetti, Reinach, and Jean Rody, Basel, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed June 21, 1974, Ser. No. 481,935

Claims priority, application Switzerland, June 29, 1973, 9506/73; Apr. 19, 1974, 5540/74; May 22, 1974, 7019/74

Int. Cl.² C07D *211/74*

U.S. Cl. 260—293.89 **19 Claims**

1. Process for the preparation of 2,2,6,6-tetramethyl-4-oxopiperidine from 2,2,4,4,6-pentamethyl-2,3,4,5-tetrahydropyrimidine (acetonine), wherein acetonine is heated

a. without water or with less than the equimolar amount of water, relative to the acetonine, and in the presence of acetone and/or diacetone alcohol, or

b. with at least the equimolar amount of water, relative to acetonine.

3,960,876
CERTAIN 1-CARBOTHIOAMIDES OF 1,8-NAPHTHYRIDINES, PYRROLO(2,3-b)PYRIDINES AND PYRIDO(2,3-b)AZEPINES

Adrian Charles Ward Curran, Newcastle-upon-Tyne, England, assignor to John Wyeth & Brother, Ltd., Maidenhead, England

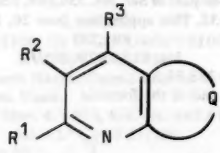
Filed Feb. 28, 1975, Ser. No. 553,964

Claims priority, application United Kingdom, Mar. 5, 1974, 9764/74; July 12, 1974, 30935/74

Int. Cl.² C07D *213/83*

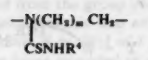
U.S. Cl. 260—294.8 C **9 Claims**

1. A compound of formula (I)



(I)

or a pharmaceutically acceptable acid addition salt thereof wherein R^1, R^2 and R^3 are the same or different and represent a hydrogen atom or a lower alkyl, phenyl lower alkyl or, phenyl radical, any of which radicals may be substituted by lower alkyl, lower alkoxy, halogen, nitro or trifluoromethyl, Q is the group



wherein N of said group is directly attached to the alpha carbon of pyridine ring, *m* is 1, 2 or 3, and the group Q may be substituted by lower alkyl, phenyl lower alkyl, or phenyl radicals any of which radicals may be substituted by lower alkyl, lower alkoxy, halogen, nitro or trifluoromethyl and R^4 is hydrogen or alkyl of 1–3 carbon atoms.

3,960,877
N-MONOSUBSTITUTED-2,3-PYRIDINEDICARBOXAMIDES, AND RELATED COMPOUNDS

Richard L. Jacobs, Perrysburg, Ohio, assignor to The Sherwin-Williams Company, Cleveland, Ohio

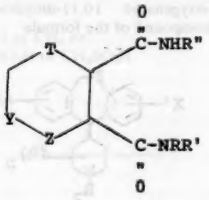
Continuation of Ser. No. 381,770, July 23, 1973, abandoned, which is a continuation of Ser. No. 82,804, Oct. 21, 1970, abandoned, which is a continuation of Ser. No. 740,046, June 26, 1968, abandoned. This application Dec. 23, 1974, Ser. No. 536,947

Int. Cl.² C07D *213/56*

U.S. Cl. 260—295.5 A **3 Claims**

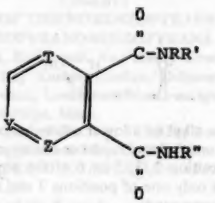
1. A compound of the formula

a)



and

b)



wherein each of T, Y and Z is nitrogen or CH and at least one is CH and at least one is nitrogen, and wherein when Y is nitrogen, T and Z are CH; and wherein one of R and R′ is hydrogen and the other is a branched chain alkyl group having from 3 to 8 carbon atoms.

3,960,878
PHENOXYALKYLAMINE CONTAINING PYRIDINES

Rudolf Theodor Petersen, Wohltorf, and Wolfgang Fleck, Hamburg, both of Germany, assignors to Beiersdorf Aktiengesellschaft, Hamburg, Germany

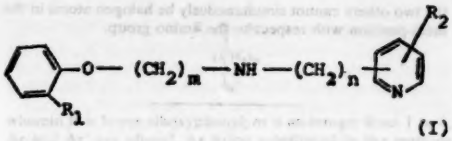
Filed Dec. 13, 1974, Ser. No. 532,673

Claims priority, application Germany, Dec. 27, 1973, 2364685

Int. Cl.² C07D *213/38*

U.S. Cl. 260—296 AE **11 Claims**

1. Compounds of the formula I:

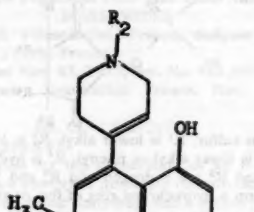


(I)

wherein
R_1 represents a chlorine atom or a methoxy group;
R_2 represents a hydrogen atom or a methyl or hydroxy group;
m is 2, 3 or 4; and
n is 1 or 2
and their physiologically acceptable acid addition salts.

3,960,879
NON-TOXIC ADL ANTIHYPERTENSIVES
Charles Sylvester Fake, Harlow, England, assignor to Beecham Group Limited, Brentford, England
Filed July 8, 1974, Ser. No. 486,366
Claims priority, application United Kingdom, July 7, 1973, 32462/73
The portion of the term of this patent subsequent to Dec. 10, 1991, has been disclaimed.
Int. Cl.² C07D *211/68*
U.S. Cl. 260—297 B **13 Claims**

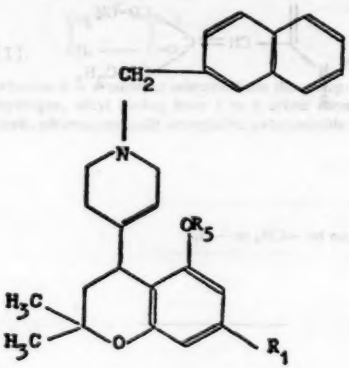
1. A compound of the formula



wherein R is alkyl of 4–8 carbon atoms, R_2 is naphthylmethyl, an ester or ether thereof wherein the phenolic hydroxyl moiety is substituted by R_3 or COR_3 wherein R_3 is methyl, ethyl, propyl, dimethylamino, diethylamino, dimethylaminopropyl, diethylaminopropyl, or N-piperidylethyl, or a pharmaceutically acceptable non-toxic salt thereof.

3,960,880
TETRAHYDROPYRID-4-YL-CHROMAN-5-OL DERIVATIVES
Charles Sylvester Fake, Harlow, England, assignor to Beecham Group Limited, England
Continuation-in-part of Ser. No. 324,222, Jan. 16, 1973, Pat. No. 3,853,899. This application Sept. 9, 1974, Ser. No. 504,087
Claims priority, application United Kingdom, Mar. 26, 1974, 13231/74; July 4, 1974, 29638/74
The portion of the term of this patent subsequent to Dec. 10, 1991, has been disclaimed.
Int. Cl.² C07D *211/68*
U.S. Cl. 260—295 F **14 Claims**

1. A compound of the formula:



(I)

and their pharmaceutically acceptable non-toxic salts, wherein R_1 is alkyl of 5 to 8 carbon atoms which is straight chained or α-substituted by a methyl group or α,α-disubstituted by methyl groups and R_5 is hydrogen, R_6 or $CO.R_6$ wherein R_6 is alkyl of 1 to 4 carbon atoms or alkyl of 1 to 6 carbon atoms substituted by NR_7R_8 wherein R_7 and R_8 are each hydrogen or alkyl of 1 to 4 carbon atoms or NR_7R_8 is pyrrolidino, piperidino or morpholino.

3,960,881
METHOD FOR PREPARING 4-CARBOXYTHIAZOLIDINE-2-THIONE
Jack E. Reece, Willernie, Minn., and George B. Fozzard, Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.
Continuation-in-part of Ser. No. 246,588, April 24, 1972, abandoned, which is a division of Ser. No. 82,175, Oct. 19, 1970, Pat. No. 3,697,516. This application Feb. 12, 1974, Ser. No. 441,834
Int. Cl.² C07D *277/16*
U.S. Cl. 260—306.7 C **4 Claims**

1. A method for preparing 4-carboxythiazolidine-2-thione which consists of reacting an alkali metal hydroxide selected from hydroxides of sodium, potassium, rubidium, cesium, and lithium, or mixtures thereof, cysteine hydrochloride hydrate, and carbon disulfide in an aqueous reaction mixture of said reactants under reaction conditions which produce 4-carboxythiazolidine-2-thione, and recovering 4-carboxythiazolidine-2-thione from the resulting reaction mixture.

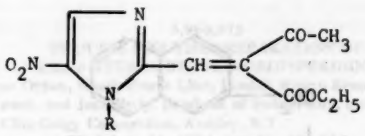
3,960,882

CHEMICAL COMPOUNDS FOR TRICHOMONIASIS AND CANDIDIOSIS TREATMENT

Roberto Montanari, Viale Bianca Maria 2, 20122 Milan, Italy

Filed Feb. 10, 1975, Ser. No. 548,739
Claims priority, application Italy, Mar. 4, 1974, 48930/74; Nov. 19, 1974, 29577/74
Int. Cl.² C07D 233/94
U.S. Cl. 424—273 5 Claims

1. A chemical compound characterized by having the following structural formula (I):



(I)

wherein R can be $-CH_3$ or $-H$.

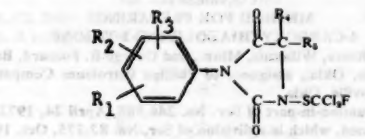
3,960,883

IMIDAZOLIDINE-2,4-DIONE DERIVATIVES AND THEIR USE AS PESTICIDES

Adolf Hubele, Magden, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Aug. 27, 1974, Ser. No. 500,983
Claims priority, application Switzerland, Sept. 3, 1973, 12605/73; Mar. 14, 1974, 3567/74
Int. Cl.² C07D 49/32
U.S. Cl. 260—309.5 9 Claims

1. An imidazolidine-2,4-dione derivative of the formula



(I)

wherein

R_1 and R_2 each independently represent hydrogen, halogen, C_1-C_3-alkyl, nitro, C_1-C_3-haloalkyl or C_1-C_3-alkoxy,

R_3 represents hydrogen, halogen or methyl, and

R_4 and R_5 each independently represent hydrogen or C_1-C_3-alkyl, whereby if one of the symbols R_1, R_2 or R_3 is hydrogen the two others cannot simultaneously be halogen atoms in the meta-position with respect to the amino group.

3,960,884

METHOD OF PREPARING RACEMIC BIOTIN

Sergei Ivanovich Zavyalov, ulitsa Garibaldi, 23/56, korpus 4, kv. 54; Natalya Alexandrovna Rodionova, ulitsa Volochaevskaya, 17a, kv. 50; Zinaida Naumovna Parnes, Novo-Alexeevskaya ulitsa 1, kv. 30; Galina Ilinichna Bolestova, Flotskaya ulitsa, 7, korpus 2, kv. 7, all of Moscow; Vladimir Vasilievich Filippov, ulitsa Mira, 40, kv. 41, Vladimir, and Lidia Lvovna Zheleznaya, Leninsky prospekt, 60/2 kv. 5ii, Moscow, all of U.S.S.R.

Filed Apr. 24, 1974, Ser. No. 463,842
Int. Cl.² C07D 49/34
U.S. Cl. 260—309.7 3 Claims

1. A method of preparing racemic biotin, which comprises reacting 2,3,8,9-tetradehydrobiotin with triethylsilane and trifluoroacetic acid, followed by isolation off the racemic biotin.

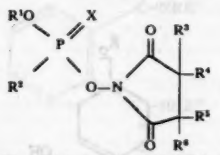
3,960,885

SUCCINIC ACID OXIMIDOPHOSPHORIC ESTERS

Karl Keihs, Lampertheim; Heinrich Adolphi, Limburgerhof, and Rolf Huber, Ludwigshafen, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Nov. 14, 1974, Ser. No. 523,665
Claims priority, application Germany, Dec. 5, 1973, 2360493
Int. Cl.² C07F 9/65
U.S. Cl. 260—326.5 A 8 Claims

1. A succinic acid oximidophosphoric ester of the formula



where X is sulfur, R^1 is lower alkyl, R^2 is lower alkoxy or phenyl, R^3 is lower alkyl or phenyl, R^4 is hydrogen or lower alkyl, R^3 and R^4 are hydrogen and R^3 and R^4 when taken together form a hydrocarbon ring of five or six members.

3,960,886

SUBSTITUTED N-ARYLANILINES

John W. Schulenberg, Bethlehem, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Division of Ser. No. 742,161, July 3, 1968, Pat. No. 3,625,972.
This application Nov. 20, 1970, Ser. No. 91,515
Int. Cl.² C07D 295/12
U.S. Cl. 260—326.5 L 5 Claims

1. A compound of the formula

wherein R is lower-alkoxyphenyl; *m* is an integer from 1 to 4; Ar and Ar' are phenyl, Ar being substituted in the meta or para position by the grouping -O-Y-N=Z, wherein Y is lower -alkylene of at least two and not more than five carbon atoms, and -N=Z is NH_2; alkylamino; cycloalkylamino in which the cycloalkyl has from 5 to 6 ring members and a total of from five to nine carbon atoms and is selected from the group consisting of unsubstituted cycloalkyl and alkylsubstituted cycloalkyl; dialkylamino; dicycloalkylamino in which the cycloalkyl has from 5 to 6 ring members and a total of from five to nine carbon atoms and is selected from the group consisting of unsubstituted cycloalkyl and alkyl-substituted cycloalkyl; N-(cycloalkyl) alkylamino in which the cycloalkyl has from 5 to 6 ring members and a total of from five to nine carbon atoms and is selected from the group consisting of unsubstituted cycloalkyl and alkyl-substituted cycloalkyl; polymethylenimino having from 5 to 7 ring members and a total of from four to nine carbon atoms selected from the group consisting of unsubstituted polymethylenimino and alkyl-substituted polymethylenimino; 4-morpholinyl; 1-piperazinyl; 4-alkyl-1-piperazinyl; 4-phenyl-1-piperazinyl; di(phenylalkyl)amino; or N-(phenylalkyl) alkylamino, alkyl in each instance having from one to six carbon atoms; and wherein the phenyl rings of Ar and Ar' can be further substituted by from one to three groups selected from the group consisting of lower-alkyl, lower-alkoxy, halogen, nitro and amino.

3,960,887

CONTINUOUS PROCESS FOR THE PREPARATION OF MALEIMIDES

Pierre Renard, Villeurbanne, France, assignor to Rhone-Poulenc S.A., Paris, France

Filed Nov. 13, 1973, Ser. No. 415,409

Claims priority, application France, Nov. 16, 1972, 72.40700

Int. Cl.² C07D *207/44*

U.S. Cl. 260—326.5 FM **11 Claims**

1. In a process for the preparation of an N-substituted maleimide which comprises preparing the corresponding maleamic acid from maleic anhydride and a primary amine and reacting said acid with a carboxylic acid anhydride and a tertiary amine selected from a trialkylamine and an N,N-dialkylaniline, in which the akyl radicals have 1 to 12 carbon atoms in the presence of a nickel catalyst, the improvement which comprises carrying out the process continuously by:

a. reacting in a first vessel, maleic anhydride and a primary amine in a solvent for the anhydride and amine, under a pressure from about 1 to 5 bars and at a temperature from about 40° to 130°C.,

b. circulating the mixture thus produced through a closed circuit equipped with a condenser, while introducing the carboxylic acid anhydride, tertiary amine and catalyst into said circuit,

c. continuously removing part of the reaction mixture which is circulating in the circuit, and

d. isolating the maleimide from the mixture thus removed.

3,960,888

PYRROLIDONE-5,5-DIPHOSPHONIC ACIDS

Walter Plöger, Hilden Rhineland; Manfred Schmidt-Dunker, Dusseldorf, and Christian Gloxhuber, Haan Rhineland, all of Germany, assignors to Henkel & Cie G.m.b.H., Dusseldorf-Holthausen, Germany

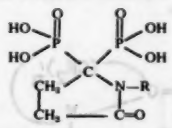
Filed Aug. 20, 1974, Ser. No. 498,997

Claims priority, application Germany, Aug. 27, 1973, 2343147

Int. Cl.² C07D *207/24*

U.S. Cl. 260—326.5 A **9 Claims**

1. Pyrrolidone-5,5-diphosphonic acid compound of the formula



wherein R is a member selected from the group consisting of hydrogen, alkyl having from 1 to 6 arbon atoms, and non-toxic, pharmaceutically acceptable water-soluble salt thereof.

3,960,889

DEHYDROHALOGENATED POLYALKENE-MALEIC ANHYDRIDE REACTION PRODUCT

William P. Cullen, Fishkill; Harry Chafetz, Poughkeepsie, and Edward F. Miller, Wappingers Fall, all of N.Y., assignors to Texaco Inc., New York, N.Y.

Division of Ser. No. 377,474, July 9, 1973, Pat. No. 3,864,270. This application Sept. 9, 1974, Ser. No. 504,214

Int. Cl.² C07D *207/40*

U.S. Cl. 260—326.5 E **3 Claims**

1. A nitrogenous dispersant derivative of a reaction product of dehydrohalogenated polyalkene-maleic anhydride and alkylene polyamine prepared by contacting polyalkene of from 30 to 300 carbons with a halogen selected from the group consisting of chlorine or bromine at a temperature of between about 20° and 150°C. utilizing a mole ratio of said polyalkene to said halogen of between about 1:0.5 and 1:3 to form a halogenated polyalkene, heating said halogenated polyalkene at a temperature of between 150° and 250°C. and recovering dehydrohalogenated polyalkene from the reaction mixture, contacting said dehydrohalogenated polyalkene with maleic anyhydride at a temperature of between about 100° and 250°C. utilizing a mole ratio of dehydrohalogenated polyalkene to maleic anhydride of between about 1:0.5 and 1:5 to form the dehydrohalogenatedmaleic anhydride reaction product, contacting said dehydrohalogenated polyalkene-maleic anhydride reaction product with an alkylene polyamine of the formula

$$H_2N\text{-}(\text{-}CH_2\text{-})_x\text{-}(HN(CH_2)_y)_zNH_2(CH_2)_2NH_2$$

where *x* is an integer of from 1 to 6, *y* is an integer of from 2 to 6, and *z* is an integer of from 0 to 4 at a temperature of between about 100° and 200°C. utilizing a mole ratio of dehydrohalogenated polyalkene-maleic anhydride reaction product to alkylene polyamine of between about 1:0.5 and 1:5 to form said nitrogenous dispersant derivative.

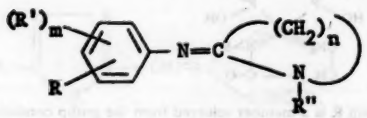
3,960,890

FLUOROALKYLPHENYLCYCLOAMIDINES AND THEIR PRODUCTION

Hartmund Wollweber, Wuppertal-Elberfeld; Edgar Enders, Cologne, and Wilhelm Stendel, Wuppertal-Elberfeld, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

Division of Ser. No. 117,709, Feb. 22, 1971, Pat. No. 3,852,304. This application Dec. 28, 1973, Ser. No. 429,191
Claims priority, application Germany, Feb. 26, 1970, 2009019
The portion of the term of this patent subsequent to Apr. 24, 1992, has been disclaimed.
Int. Cl.² C07D 207/50
U.S. Cl. 260—326.85 13 Claims

1. A compound of the formula:



or a pharmaceutically acceptable non-toxic salt thereof, wherein

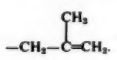
n is 3, 4 or 5,

m is 1,

R is trifluoromethyl or difluoromethyl

R′ is fluorine, chlorine or bromine, alkyl of 1 to 4 carbon atoms or alkenyl of 2 to 4 carbon atoms and

R″ is $-CH_2-CH=CH_2$; $-CH_2-CH=CH-CH_3$; or



3,960,891

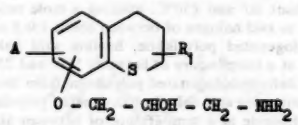
THIOCHROMAN COMPOUNDS

Charles Malen, Fresnes, and Michel Lauble, Vaucresson, both of France, assignors to Science-Union et Cie, France

Filed Mar. 31, 1971, Ser. No. 130,010
Claims priority, application United Kingdom, Apr. 6, 1970, 16118/70
Int. Cl.² C07D 335/06
U.S. Cl. 260—327 TH 6 Claims

1. A compound selected from the group consisting of:

a. (3-amino-2-hydroxy propyloxy) thiochromans of the formula



wherein:

A is selected from the group consisting of hydrogen and halogen;

R_1 is selected from the group consisting of hydrogen and lower alkyl containing from 1 to 5 carbon atoms inclusive; and

R_2 is selected from the group consisting of linear and branched lower alkyl containing from 1 to 5 carbon atoms inclusive and cyclo lower alkyl containing from 3 to 6 carbon atoms inclusive; and having the (3-amino-2-hydroxy propyloxy) group bonded to the thiochroman in the 6,7, or 8 position and

b. Physiologically tolerable acid addition salts thereof.

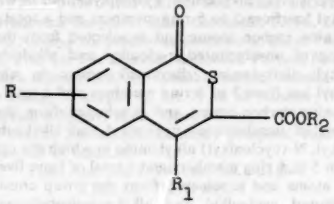
3,960,892

1-OXO-1H-2-BENZOTHIOPYRAN-3-CARBOXYLIC ACID DERIVATIVES

Thomas M. Bare, Milwaukee, and John T. Shu, Mequon, both of Wis., assignors to Richardson-Merrell Inc., Wilton, Conn.

Filed July 3, 1974, Ser. No. 485,378
Int. Cl.² C07D 335/06
U.S. Cl. 260—327 TH 2 Claims

1. A compound of the formula



in which R is lower alkoxy of 1 to 4 carbon atoms, R_1 is hydrogen or lower alkyl of 1 to 4 carbon atoms, and R_2 is hydrogen or sodium.

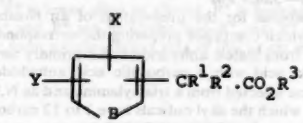
3,960,893

PHENYL-THIENYL-ALKANOIC ACID DERIVATIVES AND PHENYL-FURYL-ALKANOIC ACID DERIVATIVES

Derrick Michael O'Mant, Macclesfield, England, assignor to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 53,007, July 7, 1970, abandoned, which is a division of Ser. No. 812,358, April 1, 1969, abandoned. This application June 28, 1973, Ser. No. 374,782
Claims priority, application United Kingdom, Apr. 16, 1968, 17895/68; Oct. 25, 1968, 50788/68; Dec. 10, 1968, 58666/68
The portion of the term of this patent subsequent to Nov. 11, 1991, has been disclaimed.
Int. Cl.² C07D 333/24
U.S. Cl. 260—332.2 A 3 Claims

1. A heterocyclic compound of the formula:



wherein B stands for an oxygen or sulphur atom, X stands for hydrogen or a chlorine or bromine atom, Y stands for phenyl or phenyl substituted by fluorine, chlorine or bromine atom, and R^1 and R^2 are the same or different and either stands for hydrogen or a methyl radical, and R^3 stands for hydrogen or a C_{1-5} alkyl, benzyl or phenyl radical, and Y and $-CR^1R^2.CO_2R^3$ and linked to non-adjacent carbon atoms of the heterocyclic nucleus, and when X stands for hydrogen, R^1 stands for a methyl radical, and non-toxic pharmaceutically-acceptable salts of said compounds wherein R^3 stands for hydrogen.

3,960,894
9-BROMO-OR CHLORO-9,10-DIHYDRO-10-DIHYDRO-10-ALKOXY-4H-BENZO[4,5]CYCLO-HEPTA[1,2-B]THIOPHEN-4-ONES

Jean-Pierre Bourquin, Magden; Gustav Schwarb, Allschwil, and Erwin Waldvogel, Aesch, all of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

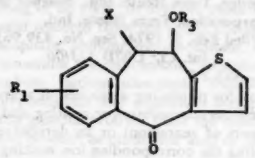
Continuation of Ser. No. 324,999, Jan. 19, 1973, abandoned. This application July 26, 1974, Ser. No. 492,008

Claims priority, application Switzerland, Jan. 24, 1972, 985/72

Int. Cl.² C07D *333/80*

U.S. Cl. 260—332.3 P 11 Claims

1. A compound of the formula:



wherein

R_1 is in the 6 or 7 position of the benzocycloheptathiophene nucleus and is hydrogen, chlorine, bromine or alkoxy of 1 to 4 carbon atoms,

R_3 is alkyl of 1 to 4 carbon atoms, and

X is chlorine or bromine.

3,960,895
ARYL KETALS OF POLYCYCLIC OXO COMPOUNDS AND PROCESSES

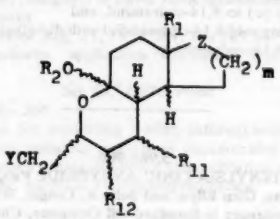
Michael Rosenberger, Caldwell, and Gabriel Saucy, Essex Fells, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 363,443, May 24, 1973, Pat. No. 3,907,827, which is a division of Ser. No. 74,519, Sept. 22, 1970, Pat. No. 3,758,509, which is a continuation-in-part of Ser. No. 11,023, Feb. 12, 1970, Pat. No. 3,708,500, which is a continuation-in-part of Ser. No. 824,319, May 13, 1969, Pat. No. 3,544,600, and a continuation-in-part of Ser. No. 825,389, May 16, 1969, abandoned. This application June 9, 1975, Ser. No. 584,799

Int. Cl.² C07D *317/44*

U.S. Cl. 260—340.5 1 Claim

1. A process for the preparation of a compound of the formula



wherein Y is

$R_9CH_2CCH(R_{14})CH(R_{15})$-;

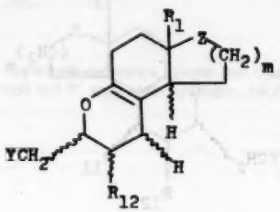
B is the remaining residue of a phenylene, 4,5-dimethylphenylene or 2,3-naphthalene moiety; R_1 is a primary alkyl group of from 1 to 5 carbon atoms; R_2 is hydrogen, lower primary alkyl or lower alkanoyl; R_8, R_{11}, R_{12}, R_{14} and R_{15} are each independently hydrogen or lower alkyl; Z is carbonyl or a group of the formula

R_7 is hydrogen or lower alkanoyl;

R_9 is

hydrogen or lower aliphatic hydrocarbyl and *m* is an integer having a a value of 1 to 2

which comprises reacting a compound of the formula



wherein R_1, R_{11}, R_{12}, Y, Z and m have the same meaning as above with a compound of the formula

R_2OH

wherein R_2 has the same meaning as above in the presence of an acid catalyst and a cosolvent wherein R_2 is hydrogen.

3,960,896
ARYL KETALS OF POLYCYCLIC OXQ COMPOUNDS AND PROCESSES

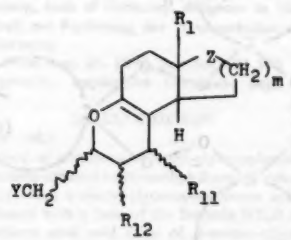
Michael Rosenberger, Caldwell, and Gabriel Saucy, Essex Fells, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 363,443, May 24, 1973, Pat. No. 3,907,827, which is a division of Ser. No. 74,519, Sept. 22, 1970, Pat. No. 3,758,509, which is a continuation-in-part of Ser. No. 11,023, Feb. 12, 1970, Pat. No. 3,708,500, which is a continuation-in-part of Ser. No. 824,319, May 13, 1969, Pat. No. 3,544,600, and a continuation-in-part of Ser. No. 825,389, May 16, 1969, abandoned. This application June 9, 1975, Ser. No. 585,145

Int. Cl.² C07D *317/44*

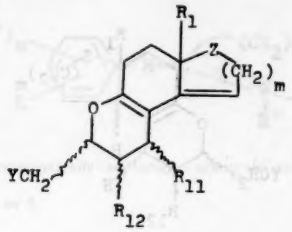
U.S. Cl. 260—340.5 2 Claims

1. A process for the preparation of a compound of the formula



wherein Y is

B is the remaining residue of a phenylene, 4,5-dimethylphenylene or 2,3-naphthalene moiety; R_1 is a primary alkyl group of from 1 to 5 carbon atoms; R_5, R_{11}, R_{12}, R_{14} and R_{15} are each independently hydrogen or lower alkyl; Z is carbonyl; m is an integer having a value of 1 to 2 and the C/D-ring fusion is cis which comprises contacting under basic conditions a compound of the formula



wherein R_1, R_{11}, R_{12}, Y, Z and m have the same meaning as above with hydrogen in the presence of a hydrogenation catalyst and an inert solvent.

3,960,897

METHOD FOR THE PREPARATION OF MACROCYCLIC COMPOUND

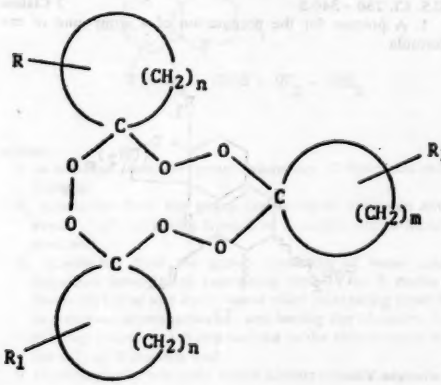
Paul Richard Story, Athens, Ga.; Peter Busch, Willich, Germany; Donald Derby Denson, Kettering, Ohio, and Carl Edward Wright, Athens, Ga., assignors to Research Corporation, New York, N.Y.

Continuation of Ser. No. 238,936, March 28, 1972, abandoned, which is a continuation-in-part of Ser. No. 842,739, July 17, 1969, abandoned, which is a continuation-in-part of Ser. No. 697,593, Jan. 15, 1968, Pat. No. 3,528,898. This application Mar. 29, 1974, Ser. No. 456,315

Int. Cl.² C07D *313/00*

U.S. Cl. 260—343 **9 Claims**

1. A method for the preparation of a product consisting essentially of a mixture of a macrocyclic hydrocarbon and a macrocyclic lactone consisting essentially of heating a mixture of (1) a peroxide having the structural formula:



wherein n is a positive integer in the range of from 4 to 17 inclusive; m is a positive integer in the range of from 4 to 17 inclusive; and R, R_1 and R_2 may be the same or different and are hydrogen or methyl; and (2) an alkane which is a solvent for said peroxide at a temperature of from about 100°C to about 350°C for a time sufficient to decompose said peroxide to said macrocyclic compounds; the weight ratio of said alkane to said peroxide being at least about 1:1.

3,960,898

ZEARALANONE-ZEARALANOL PRODUCT

Edward B. Hodge, Terre Haute, Ind., assignor to Commercial Solvents Corporation, Terre Haute, Ind.

Filed Feb. 5, 1974, Ser. No. 439,961

Int. Cl.² C07D *313/00*

U.S. Cl. 260—343.2 F **16 Claims**

1. A method for producing a mixture of zearalanone or its derivatives and corresponding low melting and high melting diastereoisomers of zearalanol or its derivatives comprising dehydrogenating the corresponding low melting diastereoisomer under dehydrogenating conditions, including elevated temperature, in a reaction medium, including dehydrogenating amounts of Raney nickel.

3,960,899

PROCESS FOR THE PREPARATION OF 8,14-CEDRANOXIDE

Edouard Giraudi, La-Roquette-sur-Siagne, and Paul José Teisseire, Grasse, both of France, assignors to Societe Anonyme des Etablissements Roure-Bertrand Fils and Justin, Dupont, Paris, France

Filed Aug. 22, 1972, Ser. No. 282,764

Claims priority, application France, Sept. 3, 1971, 71.31875

Int. Cl.² C07D *307/00*

U.S. Cl. 260—346.2 M **10 Claims**

1. A process for preparing 8,14-cedranoxide starting from cedrol, which comprises the following steps, taken in sequence:

a. treating cedrol with nitrous acid to form cedryl nitrite,

b. subjecting cedryl nitrite prepared according to step (a) to photolysis to form 14-nitroso-cedran-8-ol,

c. heating the 14-nitroso-cedran-8-ol prepared according to step (b) to form 14-oximino-cedran-8-ol,

d. converting 14-oximino-cedran-8-ol prepared according to step (c) to 8,14-cedrandiol, and

e. cyclizing said 8,14-cedranediol with dimethyl sulfoxide to form 8,14-cedranoxide.

3,960,900

POLYBUTENYLSUCCINIC ANHYDRIDE PRODUCTION

Imre Puskas, Glen Ellyn, and John A. Cengel, Wheaton, both of Ill., assignors to Standard Oil Company, Chicago, Ill.

Filed May 10, 1973, Ser. No. 358,915

Int. Cl.² C07D *307/60*

U.S. Cl. 260—346.8 R **4 Claims**

1. The method of preparing polybutenylsuccinic anhydride which comprises reacting at a temperature in the range of 150° to 300°C from 0.85 to 5.0 moles maleic anhydride per mole of polybutene in the composition comprising a viscous polybutene having a $\overline{M}_n$ in the range of about 300 to about 3000 and based on said polybutene from 5 to 200 ppm of a 40° to 225°C boiling bromo- or chlorobromo-substituted aliphatic hydrocarbon.

3,960,901

PREPARATION OF CITRACONIC ACID

Rudolph G. Berg, Groton, Conn., assignor to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 396,872, Sept. 12, 1973, abandoned. This application Apr. 7, 1975, Ser. No. 565,432

Int. Cl.² C07D 307/60; C07C 51/00

U.S. Cl. 260—346.8 R 10 Claims

1. A process for the preparation of citraconic anhydride or acid which comprises heating in an inert atmosphere at a temperature of 220°–280°C at a contact time of 0.2 – 1 second and under a pressure of 15–100mm of mercury a five-carbon acid selected from the group consisting of citramalic acid, mesaconic acid, paraconic acid, 3-methylmalic acid, or mixtures thereof, in the presence of a catalyst selected from the group consisting of an alkali or alkaline earth metal salt of a phosphoric acid selected from the group consisting of potassium pyrophosphate, sodium pyrophosphate, calcium pyrophosphate, strontium pyrophosphate, rubidium phosphate, cesium phosphate, barium phosphate, calcium phosphate, sodium tripolyphosphate and potassium metaphosphate, removing formed gaseous product from the reaction zone and recovering said product as citraconic acid or anhydride.

3,960,902

SYNTHETIC HORMONES FOR INSECT CONTROL

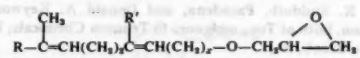
William S. Bowers, Bowie, Md., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 363,294, May 23, 1973, which is a division of Ser. No. 78,577, Oct. 6, 1970, abandoned. This application July 2, 1975, Ser. No. 592,688

Int. Cl.² C07D 303/22

U.S. Cl. 260—348 R 1 Claim

1. A compound of the general formula



wherein R and R′ are selected from the group consisting of methyl and ethyl; and x is a number from 1 to 2.

3,960,903

PROCESS FOR PREPARING 1-NITRO-ANTHRAQUINONE

Karl Linhart, Leverkusen, and Reinold Schmitz, Blecher, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Aug. 27, 1974, Ser. No. 501,017

Claims priority, application Germany, Sept. 5, 1973, 2344736

Int. Cl.² C07C 49/68

U.S. Cl. 260—369 10 Claims

1. Process for separating 1-nitro-anthraquinone from an anthraquinone nitration mixture in concentrated nitric acid which comprises adding sulpholan to the nitration mixture and separating the insoluble 1-nitro-anthraquinone.

3,960,904

6-AMINOMETHYLATED 3-OXYGENATED CHOLEST-5-ENES

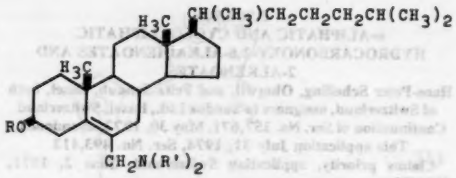
Leonard N. Nysted, Highland Park, Ill., assignor to G. D. Searle & Co., Chicago, Ill.

Filed June 6, 1975, Ser. No. 584,512

Int. Cl.² C07J 9/00

U.S. Cl. 260—397.2 14 Claims

1. A compound of the formula



wherein R represents hydrogen, alkanoyl of the formula

$$C_aH_{2a+1}CO-$$

in which a represents a positive integer less than 8, or methanesulphonyl and R′ represents hydrogen, alkyl of the formula

$$C_bH_{2b+1}-$$

in which b represents a positive integer less than 8, hydroxyalkyl of the formula

$$HOC_cH_{2c}-$$

in which c represents a positive integer more than 1 and less than 5, or alkoxyalkyl of the formula

$$C_dH_{2d+1}OC_eH_{2e}-$$

in which d represents a positive integer greater than 1 and less than 5 and e represents a positive integer greater than 1 and less than 4.

3,960,905

DIACYLGLYCEROPHOSPHORIC ACID ESTERS OF AMINOETHANOL AND METHYLAMINOETHANOL AND METHOD OF PREPARING THE SAME

Hansjorg Eibl, Bovenden, and Alfar Nicksch, Goettingen-Nikolausberg, both of Germany, assignors to Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V., Goettingen, Germany

Filed Aug. 28, 1974, Ser. No. 501,258

Claims priority, application Germany, Sept. 6, 1973, 2345059

Int. Cl.² C07F 9/09

U.S. Cl. 260—403 3 Claims

1. A method of preparing a diacyl-glycerophosphoric acid ester of β-amino-ethanol or N-methyl-β-amino-ethanol which comprises reacting a diacyl-glycerophosphoric acid ester of β-bromoethanol with a base of the formula NH_3R in a liquid solvent medium until said ester of β-amino-ethanol or N-methyl-β-amino-ethanol is formed, in said formula R being hydrogen or methyl, acyl in said diacyl being alkanoyl or alkenoyl having 10 to 22 carbon atoms.

3,960,906

ω-ALIPHATIC AND CYCLOALIPHATIC HYDROCARBONOXY-2,6-ALKADIENOATES AND 2-ALKENOATES

Hans-Peter Schelling, Oberwil, and Fritz Schaub, Basel, both of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

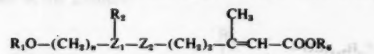
Continuation of Ser. No. 257,671, May 30, 1972, abandoned. This application July 31, 1974, Ser. No. 493,412

Claims priority, application Switzerland, June 2, 1971, 8036/71

Int. Cl.² C11C 3/02

U.S. Cl. 260—410.9 R 8 Claims

1. A compound of the formula:

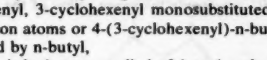


wherein R_1 is alkyl of 1 to 6 carbon atoms, cyclohexyl, cyclohexyl monosubstituted by alkyl of 1 to 4 carbon atoms, 4-(cyclohexyl)-n-butyl ring monosubstituted by n-butyl, 2-cyclohexenyl, 3-cyclohexenyl monosubstituted by alkyl of 1 to 4 carbon atoms or 4-(3-cyclohexenyl)-n-butyl ring monosubstituted by n-butyl,

R_2 is hydrogen or alkyl of 1 to 4 carbon atoms,

R_6 is alkyl of 1 to 5 carbon atoms,

Z_1-Z_2 is



and n is 2 or 3.

3,960,907

ESTERS OF CYCLOPROPYL SUBSTITUTED CARBOXYLIC ACIDS

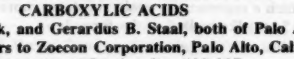
Clive A. Henrick, and Gerardus B. Staal, both of Palo Alto, Calif., assignors to Zoecon Corporation, Palo Alto, Calif.

Filed July 17, 1974, Ser. No. 489,207

Int. Cl.² C11C 3/02

U.S. Cl. 260—410.9 R 10 Claims

1. Compounds of the formula I



(I)

wherein n is an even integer of 6 to 14 and R is alkyl of one to 16 carbon atoms, with the proviso that the total number of carbon atoms in the molecule is at least 15 but not more than 26 carbon atoms.

3,960,908

PROCESS FOR PREPARING ORGANOSILVER CARBOXYLATES

Shinpei Ikenoue, and Takao Masuda, both of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Jan. 21, 1974, Ser. No. 435,127

Claims priority, application Japan, Jan. 22, 1973, 48-9362

Int. Cl.² C07F 1/10; C07C 51/00

U.S. Cl. 260—414 20 Claims

1. A process for preparing organosilver carboxylates comprising mixing:

a. an emulsion of a solvent having a solubility at 20°C of less than two parts by weight in 100 parts of water, which solvent is selected from the group consisting of the esters of alcohols or phenols with phosphoric acid, phthalic acid or a carboxylic acid, which are liquid at normal temperatures, aliphatic hydrocarbons and aromatic hydrocarbons, with an aqueous solution of an organic carboxylate selected from the group consisting of alkali metal, alkaline earth metal, and ammonium salts of long chain aliphatic carboxylic acids having 10 or more carbon atoms whose silver salt is relatively stable to light, and

b. an aqueous solution of a silver salt having a solubility at 20°C of at least 0.2 g per 100 g of water;

said mixing taking place at a temperature below the boiling point of said solvent.

3,960,909

PROCESS FOR PREPARING PALLADIUM(II)ACETYLACETONATE

Gerhard Kunstle, Raitenhaslach, and Herbert Siegl, Haiming, both of Germany, assignors to Wacker-Chemie GmbH, Munich, Germany

Filed Jan. 7, 1975, Ser. No. 539,123

Claims priority, application Germany, Jan. 18, 1974, 2402383

Int. Cl.² C07F 15/08

U.S. Cl. 260—429 J 6 Claims

1. A process for preparing palladium(II)acetylacetonate having a low content in organically linked chlorine by reaction of acetylacetone with palladium dichloride or an alkalitetrachloropalladinate selected from the group consisting of potassium and sodium tetrachloropalladinate, which comprises dissolving the starting palladium compound in 1½ to 2½ times the amount by weight of concentrated hydrochloric acid, adding to the solution at least the stoichiometric amount and up to 10 molar % of acetylacetone, stirring until the solution has become clear, adjusting the solution to a pH value between 7 and 8 by drop-wise addition of an aqueous alkalihydroxide solution, separating the precipitated palladium(II)-acetylacetonate from the solution, rinsing with water to free the precipitate from inorganic chloride, and drying.

3,960,910

PROCESS FOR THE PURIFICATION OF GAS STREAMS

Jerome R. Sudduth, Pasadena, and Donald A. Keyworth, Houston, both of Tex., assignors to Tenneco Chemicals, Inc., Saddle Brook, N.J.

Filed Jan. 6, 1975, Ser. No. 538,616

Int. Cl.² C07F 1/08

U.S. Cl. 260—438.1 5 Claims

1. In the process for the separation of a complexible ligand selected from the group consisting of olefins having 2 to 20 carbon atoms, acetylenes having 2 to 6 carbon atoms, aromatics have 6 to 12 carbon atoms, carbon monoxide and mixtures thereof from a gas stream that contains said complexible ligand and reactive impurities selected from the group consisting of water, alcohols, ammonia, amines, hydrogen cyanide, hydrogen sulfide, alkyl mercaptans, alkyl sulfides, and mixtures thereof, wherein the gas stream is contacted with a liquid sorbent that is a solution in an aromatic hydrocarbon of a bimetallic salt complex having the formula $CuAlCl_4$.Aromatic, wherein Aromatic is a monocyclic aromatic hydrocarbon having 6 to 12 carbon atoms, thereby forming a reaction mixture comprising a solution of a complex of the bimetallic salt complex and the ligand in the liquid sorbent, the reaction mixture is separated from the gas stream, the ligand is separated from the reaction mixture, and the reaction mixture is recycled, the improvement that comprises removing said reactive impurities from the gas stream before the gas stream is contacted with said liquid sorbent by

a. contacting the gas stream that contains said complexible ligand and up to 3 mole percent of said impurities with siad liquid sorbent, thereby forming a purification medium that comprises the bimetallic salt complex $CuAlCl_4$.Aromatic, at least one product of the reaction of the reactive impurities with the bimetallic salt complex $CuAlCl_4$.Aromatic, and the aromatic hydrocarbon;

b. separating a purified gas stream that contains the complexible ligand and less than 1 ppm of the reactive impurities from said purification medium;

c. contacting said purification medium with the gas stream that contains the complexible ligand and up to 3 mole percent of reactive impurities;

d. seperating a purified gas stream that contains the complexible ligand and less than 1 ppm of reactive impurities from the purification medium;

e. repeating steps c) and d) until the purification medium contains an amount of solid reaction products that interferes with the passage of the gas stream through said medium; and

f. recovering the complexible ligand from the purified gas stream that is separated from the purification medium in steps b) and d).

3,960,911

FERROCENE COMPOUNDS AND PREPARATION

John Louis Suschitzky, and David Rutherford, both of Loughborough, England, assignors to Frisons Limited, London, England

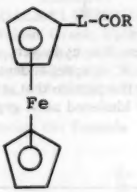
Filed Nov. 11, 1974, Ser. No. 522,591

Claims priority, application United Kingdom, Nov. 21, 1973, 54002/73; July 17, 1974, 31609/74

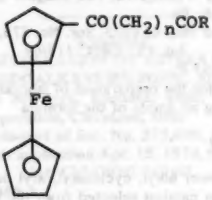
Int. Cl.² C07F *15/02*

U.S. Cl. 260—439 CY 12 Claims

1. A process for the production of a compound of the formula

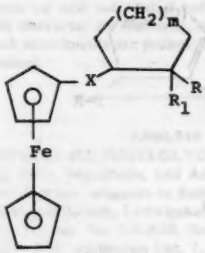


which comprises cyclizing and dehydrating a compound of the formula

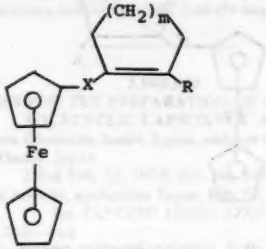


in which formula L is an unsubstituted cycloalkene group containing 5, 6 or 7 carbon atoms with the sole double bond therein being connected to the carbon atoms which is directly connected to the ferrocenyl radical, n is one of the integers 4, 5 or 6 and R is alkyl, chlorine, bromine, phenyl, or phenyl substituted by one or more halogen or alkyl groups.

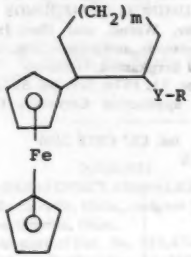
2. A compound of the formulas



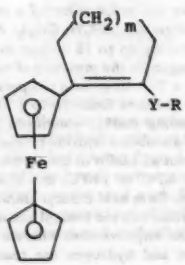
(1)



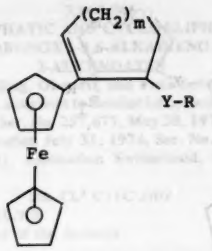
(2)



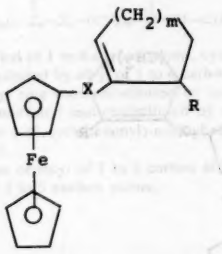
(3)



(4)



(5)



(6)

in which R is alkyl, chlorine, bromine, phenyl, or phenyl substituted by one or more halogen or alkyl groups,

X is a group —CO—, —CHOH or —CH_2—,

Y is a group —CO—, —CHOH or —CH_2—,

m is an integer from 1 to 3, and

R_1 is hydrogen, or is hydrogen or —OH when X is -CO-. .

3,960,912
PROCESS FOR THE PREPARATION OF TRIALKYL ALUMINUM COMPOUNDS

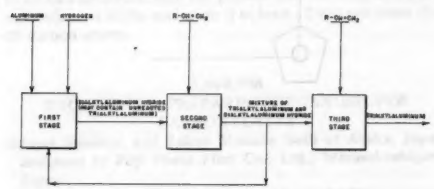
Karl Heinz Mueller, Werne, and Hans-Juergen Hubert, Hamm, both of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Germany

Filed Dec. 11, 1974, Ser. No. 531,738

Claims priority, application Germany, Dec. 13, 1973, 2361988

Int. Cl.² C07F 5/06

U.S. Cl. 260—448 A **2 Claims**



1. In a process for the preparation of a trialkyl aluminum compound of the formula $(R\text{-}CH_2\text{-}CH_2)_3$ Al, wherein R is hydrogen or alkyl having up to 18 carbon atoms, by reacting aluminum and hydrogen, in the presence of said trialkyl aluminum compound, in a first stage at a temperature from 80°C. to 180°C. and at a pressure from 50 to 250 atmospheres to form the corresponding dialkyl aluminum hydride, decompressing the dialkyl aluminum hydride product and reacting it in a second stage with an olefin of the formula $R\text{-}CH{=}CH_2$ at a temperature from 60°C. to 140°C. and at a pressure from 1 to 20 atmospheres to form said trialkyl aluminum compound, and recycling a portion of said trialkyl aluminum compound to said first stage, the improvement wherein

1. said aluminum and hydrogen are reacted in said first stage in the presence of a mixture of said trialkyl aluminum and of the corresponding dialkyl aluminum hydride, which mixture contains from 3 to 50 mol percent of said dialkyl aluminum hydride, to form a reaction product which is said dialkyl aluminum hydride alone or in admixture with unreacted trialkyl aluminum;

2. this product from the first stage is partially reacted in said second stage with an olefin of the formula $R\text{-}CH{=}CH_2$ to form a mixture of trialkyl aluminum hydride and the corresponding dialkyl aluminum hydride, which mixture contains from 3 to 50 mol percent of dialkyl aluminum hydride;

3. a portion of the reaction product from this second stage is recycled to said first stage; and

4. the remainder of the reaction product from this second stage is reacted, also at a temperature from 60°C. to 140°C. and at a pressure from 1 to 20 atmospheres, in a third stage with further olefin of the formula $R\text{-}CH{=}CH_2$ to form said trialkyl aluminum, whereby a highly pure trialkyl aluminum product is obtained.

3,960,913
HALOGENATED ALKOXYSILANE INTERMEDIATE COMPOUNDS AND THEIR PREPARATION

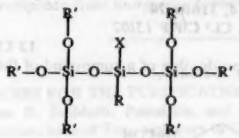
Karl O. Knollmueller, Hamden, Conn., assignor to Olin Corporation, New Haven, Conn.

Filed Sept. 24, 1975, Ser. No. 616,437

Int. Cl.² C07F 7/04, 7/18

U.S. Cl. 260—448.8 R **15 Claims**

1. A compound of the formula:



wherein X is a halogen, R is hydrogen, an alkyl, alkenyl, aryl or aralkyl, and each R′ is independently selected from the same group as R with the proviso that at least a majority of R′ radicals are sterically hindered alkyl groups having at least 3 carbon atoms.

3,960,914
CONVERSION OF FORMAMIDES TO ISOCYANATES

James E. Lyons, Wallingford, Pa., assignor to Sun Ventures, Inc., St. Davids, Pa.

Filed May 6, 1975, Ser. No. 575,096

Int. Cl.² C07C 118/04

U.S. Cl. 260—453 P **6 Claims**

1. A process for the preparation of isocyanate which comprises contacting an amide of the formula

R—NHCHO

wherein R is lower alkyl, cycloalkyl, aryl or aralkyl, with a dehydrogenation catalyst selected from the group consisting of palladium black, palladium on suitable supports, ruthenium black, ruthenium on suitable supports, platinum black, and platinum on suitable supports, at a temperature of from about 50°–300°C, under substantially anhydrous conditions, to form the corresponding isocyanate of the formula

R—N=C=O

wherein R is as defined above.

3,960,915

PROCESS FOR THE PREPARATION OF ISOPROPENYL ISOCYANATE

Dieter Arlt, and Josef Bremen, both of Cologne, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Oct. 9, 1975, Ser. No. 621,175
Claims priority, application Germany, Oct. 23, 1974, 2450285
Int. Cl.² C07C 118/00
U.S. Cl. 260—453 P 2 Claims

1. A process for the preparation of isopropenyl isocyanate comprising pyrolyzing 5-isopropenyl-1,3,4-dioxazolinone-2 in the gaseous phase at a temperature of above 200°C.

3,960,916

MANUFACTURE OF ORGANIC ISOCYANATES

Werner Fuchs, Ludwigshafen; Rolf Platz, Mannheim, and Volker Vogt, Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Jan. 24, 1975, Ser. No. 543,693
Claims priority, application Germany, Feb. 1, 1974, 2404774
Int. Cl.² C07C 118/02
U.S. Cl. 260—453 PH 8 Claims

1. A method of preparing organic isocyanates which comprises:

a. mixing a primary amine with at least one mole of hydrogen chloride per amino group of said primary amine in the absence of an organic solvent and simultaneously grinding the reaction mixture to an average particle size of from about 1 to about 100μ and

b. reacting the resulting suspension of amine hydrochloride in hydrogen chloride with at least 2 moles of phosgene per amine hydrochloride group in the absence of an organic solvent at a temperature of from about 100° to about 180°C and at a pressure of from about 14 to about 55 bar to form the corresponding isocyanate.

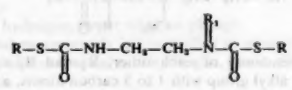
3,960,917

BIS-CYCLOALKYLTHIOCARBAMATES

Ferenc M. Pallos, Walnut Creek, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Filed May 5, 1975, Ser. No. 574,472
Int. Cl.² C07C 155/03
U.S. Cl. 260—455 A 7 Claims

1. A compound having the formula



wherein R is cycloalkyl having from 3 to 7 carbon atoms, and R_1 is lower alkyl.

3,960,918

PREPARATION OF ESTERS OF AMIDOALKANESULFONIC ACIDS

Calvin William Schroeck, Eastlake, Ohio, assignor to The Lubrizol Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 373,698, June 26, 1973, abandoned. This application Apr. 15, 1974, Ser. No. 461,205
Int. Cl.² C07C 143/68
U.S. Cl. 260—456 A 13 Claims

1. A method for the preparation of an ester of an amidoalkanesulfonic acid which comprises bringing into contact, at a temperature between about −10° and 50°C., said acid and sulfur trioxide as fuming sulfuric acid or as a solution or dispersion in a diluent which is inert to the reagents used, and subsequently contacting the reaction mass thus obtained, at a temperature of about 0°–50°C., with an organic hydroxy compound of the formula ROH, wherein R is a hydrocarbon or substituted hydrocarbon radical; with the proviso that the substituents on said substituted radical do not alter significantly its character or reactivity, and no more than about three such substituents are present for each 10 carbon atoms in the radical.

3,960,919

SUBSTITUTED SULFONYLGLYCOLIC ACID ANILIDES

Wolfgang Rohr, Mannheim, and Adolf Fischer, Mutterstadt, both of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Division of Ser. No. 310,640, Nov. 29, 1972, Pat. No. 3,865,860. This application Oct. 7, 1974, Ser. No. 512,670
Claims priority, application Germany, Dec. 6, 1971, 2160380
Int. Cl.² C07C 143/38
U.S. Cl. 260—456 A 6 Claims

1. O-methylsulfonylglycolic acid-(N-isopropyl)-anilide.

6. O-isopropylsulfonylglycolic acid-(N-isopropyl)-anilide.

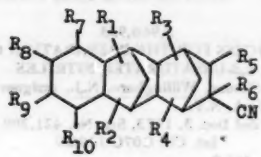
3,960,920

PROCESS FOR THE PREPARATION OF A SATURATED POLYCYCLIC CARBOXYLIC ACID

Junichirow Ohotsubo, Izumi, Japan, assignor to Nard Institute, Ltd., Osaka, Japan

Filed Feb. 13, 1975, Ser. No. 549,798
Claims priority, application Japan, Feb. 15, 1974, 49-18983
Int. Cl.² C07C 120/00, 121/46
U.S. Cl. 260—464 2 Claims

1. A compound of the formula:



wherein R_1, R_2, R_3, R_4, R_5, R_6, R_7, R_8, R_9 and R_{10} are each hydrogen or methyl.

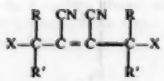
3,960,921

DIHALODICYANO ALKENES

Van C. Vives, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 451,474, March 15, 1974, abandoned. This application Apr. 14, 1975, Ser. No. 567,828
Int. Cl.² C07C 121/30, 121/48, 121/70
U.S. Cl. 260—464 5 Claims

1. An isomirsic mixture of a dihalodicyano alkene of the formula



having from 6 to 38 carbon atoms per molecule, wherein X is a halogen selected from the group consisting of chlorine and bromine; each R is individually selected from the group consisting of hydrogen, alkyl having from 1 to 4 carbon atoms, cycloalkyl having from 3 to 6 carbon atoms and aryl having from 6 to 10 carbon atoms; and each R′ is individually selected from the group consisting of hydrogen, alkyl having from 1 to 4 carbon atoms and cycloalkyl having from 3 to 6 carbon atoms.

3,960,922

N-CYANOMETHYL-N-METHYL-3,5-DIMETHYLBENZAMIDE

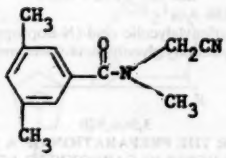
Don R. Baker, Orinda; Francis H. Walker, Mill Valley, and Peter E. Letchworth, Cupertino, all of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 417,306, Nov. 19, 1973, abandoned. This application Dec. 24, 1974, Ser. No. 536,275

Int. Cl.² C07C *121/78*

U.S. Cl. 260—465 D **1 Claim**

1. The compound



3,960,923

PROCESS FOR THE PREPARATION OF α,β-UNSATURATED NITRILES

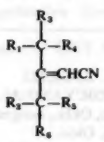
Robert S. DeSimone, Willingboro, N.J., assignor to Rhodia, Inc., New York, N.Y.

Filed Dec. 3, 1973, Ser. No. 421,200

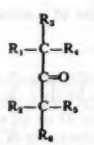
Int. Cl.² C07C *120/00*

U.S. Cl. 260—465.9 **28 Claims**

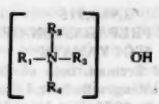
1. A process for preparing α, β-unsaturated nitriles having the formula:



which comprises reacting an aliphatic ketone having the formula:



wherein R_1 and R_2 are selected from the group consisting of hydrogen and alkyl and alkenyl groups having from one to about 20 carbon atoms, and R_3, R_4, R_5, and R_6 are selected from the group consisting of hydrogen and alkyl groups having from one to about 20 carbon atoms, with acetonitrile at a temperature within the range from about 20° to about 200°C in the presence of a strong base selected from the group consisting of alkali metal hydroxides, barium hydroxide, and quaternary ammonium hydroxides having the formula:



wherein R_1, R_2, R_3, and R_4 are organic radicals having from one to about thirty carbon atoms and selected from the group consisting of alkyl, hydroxyalkyl, cycloalkyl, aryl, and aryl substituted with alkyl, hydroxyalkyl and halogen, thereby inserting a = CHCN group at the keto carbon atom of the ketone, displacing the oxygen atom, with the formation of an unsatured bond at the α, β-position between the methylene carbon of the acetonitrile and the keto carbon of the ketone.

3,960,924

PROCESS FOR THE PREPARATION OF UNSATURATED CYANOCARBONYL COMPOUNDS

Gerrit E. Beekhuis, Geleen, and Leonardus H. Geurts, Sittard, both of Netherlands, assignors to Stamicarbon B.V., Geleen, Netherlands

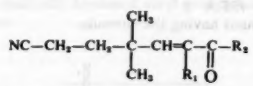
Filed Mar. 11, 1975, Ser. No. 557,380

Claims priority, application Netherlands, Mar. 11, 1974, 7403200

Int. Cl.² C07C *120/00*

U.S. Cl. 260—465.9 **7 Claims**

1. A process for the preparation of unsaturated cyanocarbonyl compounds of the general formula



where, independently of each other, R_1 and R_2 represent hydrogen, an alkyl group with 1 to 5 carbon atoms, a cycloalkyl group with 5 to 10 carbon atoms, or, together with two adjacent carbon atoms, a saturated ring structure of 5 to 12 carbon atoms,

comprising step (a) reacting acrylonitrile with isobutyraldehyde in the liquid phase to form 2,2-dimethyl-4-cyanobutyraldehyde and step (b) reacting 2,2-dimethyl-4-cyanobutyraldehyde with a compound of the formula

wherein, R_1 and R_2 are as defined above, wherein step (a) and step (b) are carried out in the presence of a catalyst which is piperidine, a primary amine, a Schiff base or mixtures thereof, and in the presence of an acid or an acidic compound,

wherein each of step (a) and step (b) is carried out at a temperature of from 75° to 250°C. and

wherein 0.01–0.25 mole of catalyst per mole of aldehyde to be converted is used in each of step (a) and step (b).

3,960,925
PRODUCTION OF ACRYLONITRILE BY AMMOXIDATION OF PROPYLENE

Edward James Gasson, Dollar; Thomas Charles Krosnar, Polmont, and Stanley Frederic Marrian, Aberdour, all of Scotland, assignors to BP Chemicals International Limited, London, England

Filed Aug. 22, 1974, Ser. No. 499,440

Claims priority, application United Kingdom, Sept. 7, 1973, 42130/73

Int. Cl.² C07C *120/14*

U.S. Cl. 260—465.3 **14 Claims**

1. A process for the production of acrylonitrile which comprises reacting at an elevated temperature in the vapor phase propylene, molecular oxygen, and ammonia over an oxide composition containing as the sole catalytic materials a mixture of oxides of the metals or oxygen containing compounds of the metals antimony, uranium, titanium and a metal selected from the group consisting of copper, iron, vanadium and mixtures thereof wherein the atomic ratio of antimony to each of copper, iron and vanadium is in the range 2:1 to 15:1, and wherein the uranium content of the composition is in the range of 1 to 10% of the total metal content of the composition.

3,960,926
PROCESS FOR PREPARING AZASULFONIUM HALIDE SALTS

Paul G. Gassman, and Gordon D. Gruetzmacher, both of Columbus, Ohio, assignors to The Ohio State University Research Foundation, Columbus, Ohio

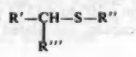
Division of Ser. No. 429,050, Dec. 28, 1973. This application Apr. 30, 1975, Ser. No. 573,059

Int. Cl.² C07C *145/02*

U.S. Cl. 260—470 **19 Claims**

1. Process for preparing an azasulfonium halide salt which comprises

a. reacting halogen with an organic sulfide compound having a formula selected from the group consisting of



I

wherein

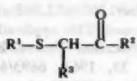
R′ is hydrogen, lower alkyl or phenyl;

R″, taken separately is lower alkyl or phenyl;

R‴, taken separately, is hydrogen, lower alkyl or phenyl; and

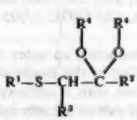
R″ and R‴, when taken together with the

moiety denote a ring containing 3 to 5 methylene carbon atoms;



II(a)

and



II(b)

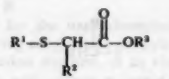
wherein

R¹ is lower alkyl or phenyl;

R² is hydrogen, lower alkyl or phenyl;

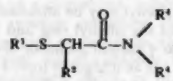
R³ is hydrogen, lower alkyl; phenyl or benzyl R² can be attached to R³ as part of a cyclic ring system containing 5 to 8 carbon atoms;

each R⁴ is lower alkyl or the two R⁴ radicals are taken together with the —O—C—O— moiety to complete a cyclic ketal or acetal having from 3 to 4 carbon atoms in the ring;



III(a)

and



III(b)

wherein

R¹ is lower alkyl, phenyl or benzyl;

R² is hydrogen, lower alkyl, phenyl or benzyl;

R³ is lower alkyl, phenyl or benzyl;

each R⁴ is hydrogen or lower alkyl, or the two R⁴ groups are taken together with the nitrogen to form a ring containing from 4 to 5 methylene carbon atoms and up to one ring oxygen atom; to form a halogen:sulfur compound complex;

(b) reacting the halogen:sulfur compound complex from step (a) with an aniline or aminopyridine to form the azasulfonium halide aniline derivative.

3,960,927
OLEFINIC DERIVATIVES OF AMINO ACIDS

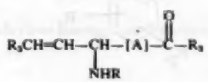
Brian Walter Metcalf, Strasbourg, and Michel Jung, Illkirch, both of France, assignors to Richardson-Merrell Inc., Wilton, Conn.

Filed Mar. 18, 1975, Ser. No. 559,544

Int. Cl.² C07C *101/00, 101/28*

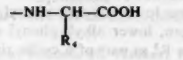
U.S. Cl. 260—471 A **6 Claims**

1. A compound of the formula:



wherein R is hydrogen, alkylcarbonyl wherein the alkyl moiety contains from 1 to 4 carbon atoms, alkoxycarbonyl wherein the alkoxy moiety contains from 1 to 4 carbon atoms and may be straight or branched or

wherein R_{10} is hydrogen, a straight or branched lower alkyl group of from 1 to 4 carbon atoms, benzyl or p-hydroxybenzyl; R_9 is hydroxy, a straight or branched alkoxy group of from 1 to 8 carbon atoms, a lower alkyl amino group wherein the alkyl moiety contains from 1 to 4 carbon atoms or



wherein R_4 is hydrogen, or a straight or branched lower alkyl group of from 1 to 4 carbon atoms, benzyl or p-hydroxyphenyl with the proviso that when R_2 is a lower alkylamino group, R is alkoxycarbonyl; R_3 is hydrogen, chlorine, bromine and iodine; [A] is —CH=CH— or

wherein R_1 is hydrogen, lower alkyl of from 1 to 4 carbon atoms, phenyl or substituted phenyl wherein the substituents on the substituted phenyl may be attached at the ortho, meta or para positions of the phenyl ring and are halogen, lower alkoxy of from 1 to 4 carbon atoms or lower alkyl of from 1 to 4 carbon atoms; n is an integer of from 1 to 5; pharmaceutically acceptable salts and individual optical isomers thereof.

3,960,928

PROCESS FOR THE MANUFACTURE OF CONDENSATION PRODUCTS FROM PHENOLS AND POLYACETOACETIC ACID ESTERS

Otto Mauz, Niederhofheim, Taunus, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Continuation of Ser. No. 402,753, Oct. 2, 1973, abandoned, which is a continuation-in-part of Ser. No. 82,810, Oct. 21, 1970, abandoned. This application Mar. 7, 1975, Ser. No. 556,219

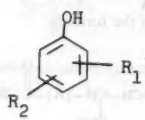
Claims priority, application Germany, Oct. 23, 1969, 1953333

The portion of the term of this patent subsequent to June 1, 1993, has been disclaimed.

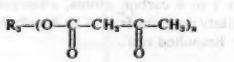
Int. Cl.² C07C *69/76*

U.S. Cl. 260—473 S **1 Claim**

1. In a process for the manufacture of a polyphenol-carboxylic acid ester from phenols of general formula I



and polyacetoacetic acid esters of general formula II



in which formulae R_1 and R_2 each stand for hydrogen atoms, identical or different alkyl radicals having 1 to 4 carbon atoms, R_3 represents a saturated, straight chain or branched aliphatic, cycloaliphatic hydrocarbon radical having from 2 to 12 carbon atoms or R_3 is p-phenylene, m-phenylene, or a naphthylene and *n* is 2 to 4, the improvement of which comprises condensing the reaction components I and II at a temperature of from −10° to +15°C in the presence of gaseous hydrogen chloride and 0.05 to 0.5 % by weight of ethyl mercaptan, calculated on the polyacetoacetic acid ester.

3,960,929

PROCESS FOR MANUFACTURE OF CONDENSATION PRODUCTS FROM PHENOLS AND ACETOACETIC ACID ESTERS

Otto Mauz, Niederhofheim, Taunus, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Continuation of Ser. No. 402,752, Oct. 2, 1973, abandoned, which is a continuation-in-part of Ser. No. 82,791, Oct. 21, 1970, abandoned. This application Mar. 7, 1975, Ser. No. 556,220

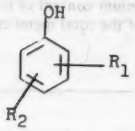
Claims priority, application Germany, Oct. 23, 1969, 1953332

The portion of the term of this patent subsequent to June 1, 1993, has been disclaimed.

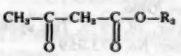
Int. Cl.² C07C *69/76*

U.S. Cl. 260—473 S **1 Claim**

1. In a process for the manufacture of bisphenolcarboxylic acid esters from phenols of general formula I



and acetoacetic acid esters of general formula II



in which formulae R_1 and R_2 each represent a hydrogen atom, identical or different alkyl radicals having 1 to 4 carbon atoms and R_3 stands for an alkyl radical having 1 to 31 carbon atoms, an allyl radical, the cyclohexyl radical, phenyl, napthyl, benzyl, or phenethyl, the improvement of which comprises condensing I and II in the presence of gaseous hydrogen chloride at a temperature of from −10° to +15°C using 0.05 to 0.5 % by weight of ethyl mercaptan, calculated on the acetoacetic acid ester, as catalyst.

3,960,930

PRODUCTION OF ESTERS

Duncan Clark, Norton-on-Tees, England, assignor to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 505,745, Oct. 29, 1965, abandoned, which is a continuation-in-part of Ser. Nos. 139,835, Sept. 22, 1961, abandoned, Ser. No. 139,836, Sept. 22, 1961, abandoned, Ser. No. 296,435, July 22, 1963, abandoned, and Ser. No. 296,438, Ser. No. 622,905

July 22, 1963, abandoned. This application Mar. 14, 1967,

Claims priority, application United Kingdom, Sept. 28, 1960, 33285/60; Feb. 23, 1961, 6693/61; Mar. 23, 1961, 10688/61; Aug. 30, 1961, 31223/61; Aug. 30, 1961, 31224/61; July 25, 1962; 28590/62; July 25, 1962, 28591/62

Int. Cl.² C07C *67/05*

U.S. Cl. 260—475 N **6 Claims**

1. A process for producing an ester of a carboxylic acid which comprises reacting in the liquid phase, an olefinically unsaturated hydrocarbon with a carboxylic acid in the presence of an alkali metal salt of a carboxylic acid, a palladous salt, a redox system and molecular oxygen under substantially anhydrous conditions.

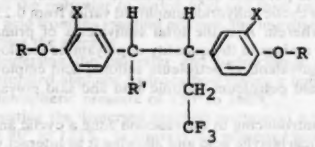
3,960,931

1,2-DIPHENYL-ETHANE DERIVATIVES

Rosalind Po-Kuen Chan, Hong Kong, Hong Kong, assignor to Biorex Laboratories, Limited, England

Filed Mar. 11, 1974, Ser. No. 450,242
Claims priority, application United Kingdom, Mar. 23, 1973, 14048/73
Int. Cl.² C07C *39/16, 43/20, 69/14*
U.S. Cl. 260—479 R 16 Claims

1. A compound of the formula:



wherein R is a hydrogen or alkyl of up to 3 carbon atoms or alkanoyl of up to 3 carbon atoms, X is hydrogen, fluorine, chlorine or bromine and R′ is alkyl of up to 3 carbon atoms.

3,960,932

PROCESS FOR THE PREPARATION OF ALDEHYDES FROM ORGANIC HALIDES

Richard F. Heck, Wilmington, Del., assignor to The University of Delaware, Newark, Del.

Filed Oct. 10, 1974, Ser. No. 513,529
Int. Cl.² C07C *45/00*
U.S. Cl. 260—479 R 9 Claims

1. A process for the preparation of aldehydes which comprises contacting aryl, vinylic and heterocyclic halides with carbon monoxide and hydrogen at about 0.1 to 1.0 to about 1.0 to 0.1 ratios under pressures of at least one atmosphere at temperatures in the range of 50° to about 175°, in the presence of a palladium catalyst and a basic tertiary amine or other basic material inert to the catalytic function of the catalyst that will readily react with acids.

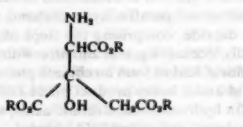
3,960,933

AMINO CITRIC ACID DERIVATIVES

Robert William Guthrie, Fairfield, and Richard Wightman Kierstead, North Caldwell, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 435,146, Jan. 21, 1974, Pat. No. 3,869,407, which is a division of Ser. No. 204,290, Dec. 2, 1971, Pat. No. 3,799,951. This application Dec. 16, 1974, Ser. No. 533,095
Int. Cl.² C07C *101/20*
U.S. Cl. 260—482 P 5 Claims

1. A compound of the formula



wherein all R groups are the same lower alkyl and the stereoisomers, optical antipodes and pharmaceutically acceptable salts thereof.

3,960,934

METHOD FOR THE OXYCARBONYLATION OF ETHYLENE AND PROPYLENE

Wolfgang Gaenzler, Darmstadt-Arheilgen; Klaus Kabs, Seeheim, and Guenter Schroeder, Ober-Ramstadt, all of Germany, assignors to Rohm GmbH, Darmstadt, Germany

Filed Mar. 24, 1975, Ser. No. 561,633
Claims priority, application Germany, Apr. 1, 1974, 2415742
Int. Cl.² C07C *69/54, 69/66*
U.S. Cl. 260—484 R 34 Claims

1. In a method for the oxycarbonylation of ethylene or propylene by reacting ethylene or propylene, in methanol or ethanol as the reaction medium, at an elevated temperature and under pressure, with carbon monoxide and oxygen in the presence of a catalyst, the improvement wherein said catalyst consists essentially of a compound, soluble in the reaction medium under the reaction conditions, of a metal selected from the group consisting of vanadium, chromium, iron, cobalt, nickel, and copper, and of a chloride, bromide, or iodide of some other non-catalytic metal, or of hydrogen, if said compound is not a chloride, bromide, or iodide.

3,960,935

NONIONIC MONOMERIC EMULSION STABILIZERS

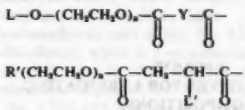
Carlos M. Samour, Wellesley, Mass., assignor to The Kendall Company, Walpole, Mass.

Filed June 22, 1972, Ser. No. 265,244
Int. Cl.² C07C *69/40, 69/54*
U.S. Cl. 260—485 G 13 Claims

1. A compound having the formula

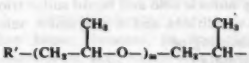
R-O-V

wherein V is 2-acryloyloxyethyl, methacryloyloxyethyl, 3-acryloyloxy-2-hydroxypropyl, 3-methacryloyloxy-2-hydroxypropyl, allyl methallyl, 3-allyloxy-2-hydroxypropyl or 3-methallyloxy-2-hydroxypropyl and R is



wherein Y is alkylene having 2 or 3 carbon atoms, —CH=CH or

n is an integer from 9 to 50; L is an aliphatic hydrocarbon chain having from 8 to 28 carbon atoms which is linked to the oxygen directly or covalently linked thereto through a phenylene linkage or is



wherein R′ is methoxy, ethoxy, acetoxy, propionoxy or hydroxyl and m is an integer from 9 to 29, L′ is an aliphatic hydrocarbon chain having from 8 to 28 carbon atoms and R′ is methoxy, ethoxy, acetoxy, propionoxy or hydroxyl.

3,960,936

NAPHTHYL ACETALDEHYDE DERIVATIVES

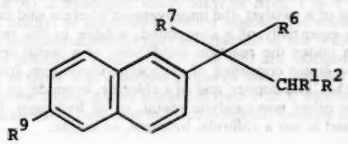
John H. Fried, and Ian T. Harrison, both of Palo Alto, Calif., assignors to Syntex Corporation, Panama, Panama

Division of Ser. No. 222,278, Jan. 31, 1972, which is a division of Ser. No. 814,855, April 9, 1969, Pat. No. 3,663,713, which is a continuation-in-part of Ser. No. 741,900, July 2, 1968, Pat. No. 3,626,012. This application Apr. 25, 1974, Ser. No. 464,028

Int. Cl.² C07C *69/02*

U.S. Cl. 260—488 CD 11 Claims

1. A compound selected from the group of compounds represented by the formula:



wherein R^1 and R^2 are alkanoyloxy having from 1 to 12 carbons or cycloalkanoyloxy having from 4 to 8 carbons; one of R^6 and R^7 is hydrogen and the other is hydrogen, methyl, ethyl or difluoromethyl; or R^6 and R^7 taken together are methylene, ethylene, or halomethylene; R^9 is alkyl having up to 6 carbons, cycloalkyl having from 3 to 7 carbons, hydroxymethyl, alkoxymethyl having up to 7 carbons, trifluoromethyl, vinyl, ethynyl, fluoro, chloro, hydroxy, alkoxy having up to 6 carbons, difluoroethoxy, alkoxymethyloxy having up to 7 carbons, alkylthio having up to 6 carbons, difluoromethylthio, alkoxymethylthio having up to 7 carbons, formyl, acetyl, or phenyl optionally substituted with one or two methyl, ethyl, isopropyl, methoxy, hydroxy, fluoro or chloro groups.

3,960,937

ASHLESS ADDITIVES FOR LUBRICATING COMPOSITIONS

Sidney Schiff, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 160,499, July 7, 1971, abandoned. This application May 4, 1972, Ser. No. 250,292

Int. Cl.² C07C *87/14*, *87/20*

U.S. Cl. 260—501.2 11 Claims

1. A process for the preparation of an ashless lubricant additive which comprises the steps:

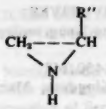
1. first introducing into a reaction zone a petroleum sulfonic acid formed by sulfonating a high molecular weight, refined petroleum fraction having a viscosity of at least 50 to about 720 SUS at 210°F with a sulfonating agent selected from fuming sulfuric acid and liquid sulfur trioxide under sulfonation conditions and a polyamine selected from the group consisting of

a. amines of the formula

$$H_2N[(CH_2)_xNH]_yH$$

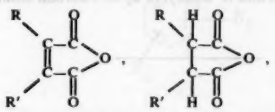
wherein x equals 2–6 and y equals 1–100, and

b. a polymer of a 1,2-alkylene imine of the formula

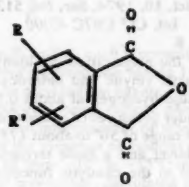


wherein R'' is selected from hydrogen and alkyl radicals having 1–14 carbon atoms, wherein the equivalents of petroleum sulfonic acid employed varies from 1 equivalent of petroleum sulfonic acid per mole of polyamine to 0.75A and the equivalents of the cyclic anhydride employed varies from 0.25 (A–E) to A–E, wherein A is the total equivalents of primary and secondary amines in the quantity of polyamine employed and E is the equivalents of petroleum sulfonic acid employed and allowing said petroleum sulfonic acid and said polyamine to interact,

2. then introducing to the reaction zone a cyclic anhydride of a dicarboxylic acid and allowing it to interact with the product of the interaction between said petroleum sulfonic acid and said polyamine, said cyclic anhydride being represented by the formulas:



or



wherein R and R' can be the same or different and are selected from the group consisting of a hydrogen atom and cyclic, acyclic and aromatic hydrocarbyl groups having 1 to 6 carbon atoms to form said ashless lubricant additive.

3,960,938

EXTRACTION OF SULFURIC ACID FROM SULFURIC ACID-SULFONIC ACID MIXTURES

Henry Shuttleworth, Trinidad, British W. Indies, assignor to Texaco Trinidad, Inc., Trinidad, British W. Indies

Filed Mar. 1, 1971, Ser. No. 120,068

Int. Cl.² C07C *139/00*

U.S. Cl. 260—504 S 7 Claims

1. Process for removing sulfuric acid from a paraffin sulfoxidation reaction mixture of mono- and di-sulfonic acids, sulfuric acid, unreacted paraffin hydrocarbons, acetic acid, water and sulfur dioxide, comprising the steps of:

repeatedly contacting said mixture with concentrated hydrochloric acid to form a raffinate phase containing sulfuric acid and a heavy product phase containing unreacted paraffin hydrocarbons, sulfonic acids, some hydrochloric acid solvent; separating said phases;

removing said hydrochloric acid from said heavy product phase; neutralizing said sulfonic acids; and steam distilling said unreacted paraffin hydrocarbons.

3,960,939

METHOD FOR PREPARING SORBIC ACID

Kunihiko Sekiyama, Kashihara; Yasuyoshi Taga, Ogaki, and Shigemi Fujita, Kaizu, all of Japan, assignors to Nippon Gohsei Kagaku Kabushiki Kaisha, Osaka, Japan

Filed June 3, 1975, Ser. No. 583,270
Int. Cl.² C07C *51/00*
U.S. Cl. 260—526 N 6 Claims

1. In a method for preparing sorbic acid by heating a polyester prepared by the reaction of crotonaldehyde with ketene, in a reaction medium in the presence of hydrochloric acid to convert the polyester to sorbic acid and then recovering the sorbic acid from the reaction mixture, the improvement which comprises the steps of

a. dispersing the polyester and hydrochloric acid into a saturated aliphatic hydrocarbon having a boiling point at atmospheric pressure of 150° to 260°C.,

b. heating the dispersed reaction mixture at a temperature of 80° to 135°C. to convert the polyester to sorbic acid,

c. allowing the reaction mixture to separate into an upper layer being hydrocarbon solution of sorbic acid and an under layer containing hydrochloric acid,

d. evaporating sorbic acid together with the hydrocarbon from the upper layer by a centrifugal thin film type evaporator, and

e. recovering sorbic acid from the evaporated sorbic acid-hydrocarbon mixture.

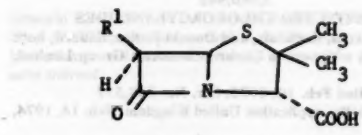
3,960,940

PROCESS FOR THE PREPARATION OF D(−)-PENICILLAMINE AND SALTS THEREOF

Joseph Elks; Niall Galbraith Weir, both of London; Timothy Larry Gane, Harrow, and Brian Burton, Ruislip, all of England, assignors to Glaxo Laboratories Limited, Greenford, England

Filed Aug. 14, 1974, Ser. No. 497,250
Claims priority, application United Kingdom, Aug. 22, 1973, 39855/73
Int. Cl.² C07C *149/243*
U.S. Cl. 260—534 S 15 Claims

1. A process for the preparation of D(−)-penicillamine and salts thereof wherein a penicillin of formula



or a salt or solvate thereof, in which R^1 is selected from the group consisting of an amino group and a blocked amino group, is reacted with a hydrazine having two —NH-groups, or a salt or solvate thereof followed by isolation of the product.

3,960,941

3-HYDROXY-3,4-DICARBAMOYLBUTYRIC ACID AND SALTS

Karl E. Wiegand, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Division of Ser. No. 347,822, April 4, 1973, Pat. No. 3,911,002, which is a division of Ser. No. 172,627, Aug. 18, 1971, Pat. No. 3,769,337. This application Jan. 20, 1975, Ser. No. 542,347
Int. Cl.² C07C *101/24*
U.S. Cl. 260—534 E 5 Claims

1. 3-hydroxy-3,4-dicarbamoylbutyric acid and the alkali metal, alkaline earth metal and ammonium salts thereof.

3,960,942

LEUCINE ISOLEUCINE SEPARATION

Pierre Hirsbrunner, Corseaux, and Raymond Bertholet, Aigle, both of Switzerland, assignors to Societe D'Assistance Technique pour Produits, Lausanne, Switzerland

Filed Jan. 20, 1975, Ser. No. 542,572
Claims priority, application Switzerland, Jan. 21, 1974, 745/74
Int. Cl.² C07C *99/12*
U.S. Cl. 260—534 R 7 Claims

7. A process for separating leucine and isoleucine from an aqueous solution thereof, said process comprising the steps of

adding a metal salt selected from the group consisting of copper salts and nickel salts to an aqueous solution containing leucine and isoleucine to form a resultant solution having a pH-value of between 1.0 and 1.8;

thereafter adjusting the pH-value of the resultant solution to a value from 2 to 3.8;

fractionating the resultant solution into a first crystallized fraction consisting of a metal leucinate and a first filtrate;

neutralizing the first filtrate;

obtaining a second crystallized fraction consisting of metal leucinate and isoleucinate from the first filtrate;

forming a second aqueous solution of the second crystallized fraction with a pH-value of between 1.3 and 2.2;

thereafter adjusting the pH-value of the second aqueous solution to a pH-value of from 2.7 to 3.8;

fractionating the resultant second solution into a third crystallized fraction consisting mostly of metal leucinate and to a lesser amount of metal isoleucinate and a second filtrate;

neutralizing the second filtrate;

thereafter collecting a fourth crystallized fraction consisting mostly of metal isoleucinate and to a lesser amount of metal leucinate from the second filtrate; and

separating the metal ions from each of the first and fourth fractions to obtain leucine and isoleucine respectively.

3,960,943

N-CYCLOALKYLDITHIO-N'-FLUOROPHENYL UREAS

Melancthon S. Brown, deceased, late of Berkeley, Calif. (by Gustave K. Kohn, special administrator), Gustave K. Kohn, Berkeley, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 526,494, Nov. 25, 1974, abandoned, which is a continuation-in-part of Ser. No. 250,907, May 8, 1972, Pat. No. 3,853,966, which is a continuation-in-part of Ser. Nos. 88,212, Nov. 9, 1970, Pat. No. 3,755,437, and Ser. No. 189,732, Oct. 15, 1971, abandoned. This application Jan. 6, 1975, Ser. No. 538,829
Int. Cl.² C07C *119/00*
U.S. Cl. 260—453 R 1 Claim

1. N-methyl-N-cyclohexyldithio-N'-2-fluorophenyl urea.

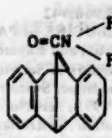
3,960,944

8-CARBOXAMIDE DIBENZOBICYCLO(3.2.1)OCTADIENES

Walton James Hammar, St. Paul, Minn., assignor to Riker Laboratories, Inc., Northridge, Calif.

Division of Ser. No. 194,056, Oct. 29, 1971, Pat. No. 3,860,652. This application Dec. 9, 1974, Ser. No. 530,670
Int. Cl.² C07C *103/22*
U.S. Cl. 260—558 R 3 Claims

1. A compound of the formula



wherein R^1 is hydrogen or lower alkyl and R^2 is lower alkyl.

3,960,945

4-[-(ALKOXY OR POLYHALOALKOXY)-BENZAMIDO]CYCLOHEXANONES

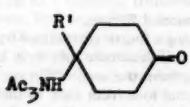
George Y. Lesher, Rensselaer; Karl O. Gelotte, Nassau, and Alexander R. Surrey, Albany, all of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Continuation-in-part of Ser. No. 462,388, April 19, 1974, Pat. No. 3,901,920. This application Feb. 24, 1975, Ser. No. 552,162

Int. Cl.² C07C *103/26*

U.S. Cl. 260—559 R 4 Claims

1. A compound of the formula



where R' is hydrogen or lower-alkyl, Ac_3 is 4-Q_1-benzoyl and Q_1 is lower-alkoxy or polyhalo-lower-alkoxy.

3,960,946

PROCESS FOR THE MANUFACTURE OF OXALYL DIHYDRAZIDE AND THE USE OF SAME AS A COOLANT IN GAS GENERATING COMPOSITIONS

Ivan L. Dewitt, and Eugene Pacanowsky, both of Elkton, Md., assignors to Thiokol Corporation, Newtown, Pa.

Division of Ser. No. 233,790, March 10, 1972, Pat. No. 3,839,105. This application Sept. 10, 1974, Ser. No. 504,784

Int. Cl.² C07C *97/16;* C01B *21/16;* C06B *45/10*

U.S. Cl. 260—561 H 5 Claims

1. A process for the preparation of oxalyl dihydrazide which comprises reacting diethyloxalate and hydrazine at a temperature between about 30°C and about 70°C in a medium consisting substantially of distilled water.

3,960,947

CONDENSATION PRODUCTS

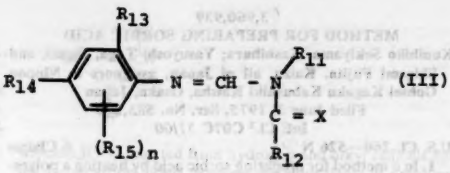
Dieter Duerr, Bottmingen, Switzerland, and Georg Pissiotas, Loerrach, Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 218,536, Jan. 17, 1972. This application May 14, 1975, Ser. No. 577,389

Int. Cl.² C07C *103/34*

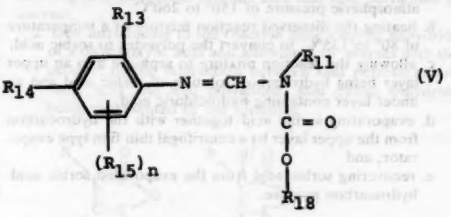
U.S. Cl. 260—561 R 4 Claims

1. A compound of the formula



(III)

or



(V)

wherein R_{11} represents alkyl containing from 1 to 4 carbon atoms or alkenyl containing from 3 to 4 carbon atoms, R_{12} represents hydrogen, alkyl containing from 1 to 12 carbon atoms, alkenyl containing from 3 to 4 carbon atoms, phenyl or naphthyl, R_{13} represents hydrogen, alkyl containing from 1 to 4 carbon atoms, $-CF_3$ or halogen, R_{14} represents hydrogen, alkyl or alkoxy each containing from 1 to 4 carbon atoms, alkenyloxy or alkinyloxy each containing from 3 to 4 carbon atoms or halogen, R_{15} represents hydrogen, halogen, alkyl containing from 1 to 4 carbon atoms, $-NO_2$ or $-CF_3$, R_{18} represents alkyl containing from 1 to 4 carbon atoms, phenyl or 2-methyl-4-chlorophenyl, X represents oxygen or sulphur, and n represents the numbers 1, 2, or 3.

3,960,948

SUBSTITUTED CHLOROACYLANILIDES

Frank Shackleton, Rochdale, and Donald Butler, Salford, both of England, assignors to Lankro Chemicals Group Limited, England

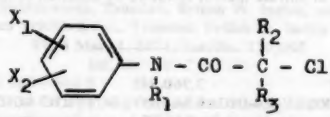
Filed Feb. 10, 1975, Ser. No. 548,577

Claims priority, application United Kingdom, Feb. 14, 1974, 6701/74

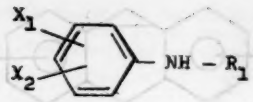
Int. Cl.² C07C *103/32*

U.S. Cl. 260—562 B 9 Claims

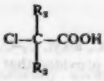
1. A process for the preparation of substituted chloroacylanilides of the general formula:



wherein R_1 is a group selected from alkyl groups having from 1 to 4 carbon atoms and a phenyl group; R_2 is an atom selected from the group consisting of a hydrogen atom and halogen atoms; R_3 is selected from the group consisting a hydrogen atom and alkyl groups having from 1 to 4 carbon atoms, and X_1 and X_2 are independently selected from the group consisting of a hydrogen atom, a halogen atom, a methyl group and an ethyl group, which process comprises acylating a substituted aniline of the general formula:



wherein R_1, X_1 and X_2 are as above defined, in the presence of phosphoryl chloride under substantially anhydrous conditions with a chlorocarboxylic acid of the general formula:



wherein R_2 and R_3 are as above defined.

3,960,949

1,2-BIGUANIDES

Hanns Ahrens; Clemens Rufer; Helmut Biere; Eberhard Schröder; Wolfgang Losert; Olaf Loge, and Ekkehard Schillinger, all of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin & Bergkamen, Germany

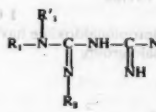
Continuation of Ser. No. 239,923, March 31, 1972, abandoned. This application July 9, 1974, Ser. No. 486,758

Claims priority, application Germany, Apr. 2, 1971, 2117015

Int. Cl.² C07C *129/16*

U.S. Cl. 260—564 B 7 Claims

1. A substituted biguanide of the formula



wherein R_1 is alkyl of 1–8 carbon atoms, R'_1 is hydrogen or alkyl of 1–8 carbon atoms and R_2 is alkoxyalkyl of 2–12 carbon atoms, and pharmaceutically acceptable acid addition salts thereof.

3,960,950

PROCESS FOR CARBODIIOMIDE SYNTHESIS

Robert L. Hansen, Roseville, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 368,355, June 8, 1973, Pat. No. 3,862,989. This application Sept. 9, 1974, Ser. No. 504,296

Int. Cl.² C07C *119/04*

U.S. Cl. 260—566 R 3 Claims

1. In the process for the formation of organic carbodiimides from organic mono- or di-isocyanates or mixtures thereof with each other or with up to one organic tri-isocyanate per average molecule of organic carbodiimide formed, said organic mono-, di- and tri-isocyanates having no active hydrogen-containing substituents which are reactive with isocyanate groups, the step comprising treating each 100 parts by weight of said organic isocyanates with from about 0.01 to 10.0 parts by weight of bicyclic terpene alkyl or hydrocarbyl aryl phosphine oxide wherein alkyl is of 1 to 10 carbon atoms and hydrocarbyl aryl is of 6 to 10 carbon atoms.

3,960,951

CERTAIN OXIME ESTERS

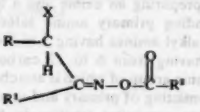
Arnold D. Gutman, Berkeley, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Continuation of Ser. No. 275,601, July 27, 1972, abandoned, which is a continuation of Ser. No. 882,336, Dec. 4, 1969, abandoned, which is a continuation-in-part of Ser. No. 649,024, June 26, 1967, abandoned. This application Aug. 5, 1974, Ser. No. 494,932

Int. Cl.² C07C *131/00*

U.S. Cl. 260—566 AC 2 Claims

1. A compound having the formula



in which X is chlorine; R is hydrogen; R^1 is chloromethyl; R^2 is alkyl having from 1 to 6 carbon atoms.

3,960,952

ANHYDROUS BASES AND SALTS OF DYESTUFFS OF THE AURAMINE SERIES, PROCESS FOR THEIR PREPARATION AND THEIR USE

Jean-Claude Henri Raoul Hardouin, Chantilly, and Maurice Rene Jean Vallette, Precy-sur-Oise, both of France, assignors to Produits Chimiques Ugine Kuhlmann, Paris, France

Filed Aug. 6, 1974, Ser. No. 495,719

Claims priority, application France, Aug. 10, 1973, 73.29331

Int. Cl.² C07C *119/00*

U.S. Cl. 260—566 R 13 Claims

1. Process for the preparation of an anhydrous base or salt of a dyestuff of the Auramine series, which comprises isolating the base or salt in acetone, methylethylketone or diethylketone, the salt being a hydrobromide, hydrofluoride, phosphate, formate, acetate, propionate, lactate, monochloroacetate, dichloroacetate, bromoacetate or cyanoacetate.

3,960,953

PREPARATION OF ACYLHYDROXIMYL HALIDES

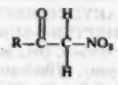
Roger G. Duranleau, Ardonia, and John M. Larkin, Wappingers Falls, both of N.Y., assignors to Texaco Inc., New York, N.Y.

Filed Dec. 12, 1974, Ser. No. 532,421

Int. Cl.² C07C *131/00*

U.S. Cl. 260—566 A 20 Claims

1. A method of preparing acylhydroximyl halides which comprises contacting a nitroketone corresponding to the formula:



where R is an alkyl group of from 1 to 50 carbon atoms with a halogen acid in the presence of a polar protic organic solvent selected from the group consisting of alkanoic acids of up to 16 carbon atoms and alkanols having from 2-16 carbon atoms.

3,960,954
PROCESS FOR PREPARING OXIMES AND HYDROXYLAMINES

Joseph Lee Russell, Ridgewood, and John Kollar, Wyckoff, both of N.J., assignors to Halcon International, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 732,079, May 27, 1968, abandoned, which is a continuation-in-part of Ser. No. 434,089, Feb. 19, 1965, abandoned, which is a continuation-in-part of Ser. No. 355,485, March 27, 1964, abandoned. This application May 11, 1970, Ser. No. 36,378

Int. Cl. C07c *119/00*

U.S. Cl. 260—566 A **4 Claims**

1. A process for preparing an oxime and a hydroxylamine from the corresponding primary amine selected from the group consisting of alkyl amines having 3 to 6 carbon atoms, cycloalkyl amines having from 6 to 12 carbon atoms, and benzylamine, the amine group of which is attached to a carbon atom of the class consisting of primary and secondary carbon atoms, which process comprises treating in the substantial absence of water the amine in the presence of a dissolved catalyst which is a compound of titanium, vanadium, chromium, selenium, zirconium, niobium, molybdenum, tellurium. tantalum, tungsten, rhenium and uranium and an organic hydroperoxide as the oxidizing agent.

3,960,955
PURIFICATION PROCESS

Lawrence F. Kuntschik, Nederland, and Orville W. Rigdon, Groves, both of Tex., assignors to Texaco Inc., New York, N.Y.

Filed Nov. 15, 1974, Ser. No. 524,109

Int. Cl.² C07C *131/00*

U.S. Cl. 260—566 A **8 Claims**

1. A process for purifying crude paraffinone oximes containing from 5 to 30 carbon atoms, from impurities consisting essentially of from about 0 to 20% by weight of carbonyl compounds and from about 0 to 4% by weight of organic chlorine impurities, said precentage of impurities based upon the weight of oxime, by:

a. forming a reaction mixture by mixing each part by weight of paraffinone oxime to be purified with from about 0.01 to 0.2 parts by weight of water, from about 0.02 to 0.5 parts by weight of a lower alkanol containing from 1 to 5 carbon atoms, and with from about 0.1 to 1 parts by weight of a complexing reagent selected from the group consisting of urea and thiourea, the urea or thiourea being added in the presence of water,

b. heating said reaction mixture between about 25° to 200°C until the organic chlorine impurities are decomposed and an insoluble carbonyl complex is formed,

c. cooling said reaction mixture to between about −10° and +10°C, and

d. removing the insoluble carbonyl complex from the purified oxime contained therein.

3,960,956
ANTIDEPRESSANT 1,1A,6,10B-TETRAHYDRODIBENZO(A,E)-CYCLOPROPA(C) CYCLOHEPTEN-6-SUBSTITUTED OXIMES

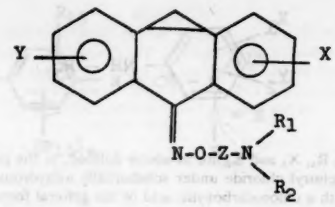
Roy Teruyuki Uyeda, Newark, Del., assignor to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Continuation-in-part of Ser. No. 525,877, Nov. 21, 1974, abandoned. This application Sept. 26, 1975, Ser. No. 616,483

Int. Cl.² C07C *131/08*

U.S. Cl. 260—566 AE **6 Claims**

1. A compound of the formula



where

X or Y = H, F, Cl, Br, C_1–C_4 alkyl, C_1–C_4 alkoxy, CF_3, CH_3S, CH_3SO_2, $SO_2N(CH_3)_2$, provided that one is H;

Z = C_2–C_3 alkylene;

R_1 and R_2 independently = H, C_1–C_4 alkyl

and its pharmaceutically suitable salts.

3,960,957
2-(6′-METHOXYNAPHTH-2′YL) PROPIONALDOXIME AND 5′-HALO DERIVATIVES THEREOF

Francisco Sanchez Alvarez, Sunnyvale, Calif., assignor to Syntex Corporation, Panama, Panama

Division of Ser. No. 354,537, April 26, 1973, Pat. No. 3,873,594, which is a division of Ser. No. 151,921, June 10, 1971, Pat. No. 3,758,544, which is a division of Ser. No. 748,603, July 30, 1968, Pat. No. 3,637,767. This application Jan. 10, 1975, Ser. No. 540,011

Int. Cl.² C07C *131/00*

U.S. Cl. 260—566 A **1 Claim**

1. A 2-(6′-methoxynaphth-2′-yl)propionaldoxime having at the C-5′ position, hydrogen or a halo group.

3,960,958
3,4- AND 3,5-DIALKOXYBENZYLAMINES

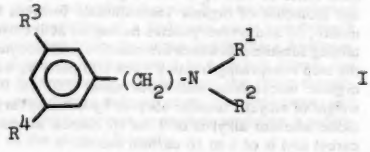
Kenneth Richardson, Canterbury, England, assignor to Pfizer Inc., New York, N.Y.

Filed Aug. 26, 1974, Ser. No. 500,377

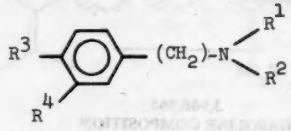
Int. Cl.² C07C *87/29*

U.S. Cl. 260—570.9 **9 Claims**

1. A compound selected from those of the formulae:



and



II

and the pharmaceutically acceptable acid addition salts thereof, wherein

R^1 is H, methyl or hydroxyalkyl of from 2 to 6 carbon atoms;

R^2 is H, alkyl of from 1 to 6 carbon atoms, or hydroxyalkyl from 2 to 6 carbon atoms, and

R^3 and R^4 are each alkoxy of from 12 to 20 carbon atoms, provided that

when R^3 is ortho to R^4, one of R^1 and R^2 is hydroxyalkyl of from 2 to 6 carbon atoms and the other is hydrogen.

3,960,959

N,N'-BIS 6-[(3,4-DIHYDROXYPHENYL)ALKYLAMINO]-HEXYL HEXAMETHYLENEDIAMINES AND THE SALTS THEREOF

Janos Piess, Basel, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

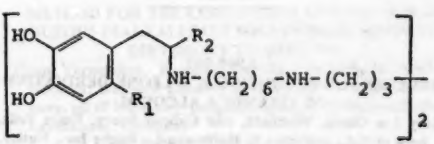
Filed Dec. 13, 1974, Ser. No. 532,465

Claims priority, application Switzerland, Dec. 19, 1973, 17769/73; Oct. 23, 1974, 14174/74; Sweden, Oct. 23, 1974, 7414173

Int. Cl.² C07C *91/32*

U.S. Cl. 260—570.5 P 5 Claims

1. A compound of formula I,



I

wherein R_1 and R_2 are hydrogen or lower alkyl, or a pharmaceutically acceptable acid addition salt thereof.

3,960,960

1,1-DIPHENYL-1-LOWER ALKOXY-AMINO-ALKANES AND THE SALTS THEREOF

Roderich Höllinger, Leonding near Linz; Wolf Wendtlandt, Linz, and Gerda Schneider, Linz, Dornach, all of Austria, assignors to Chemie Linz Aktiengesellschaft, Linz, Austria

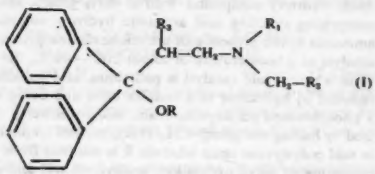
Continuation-in-part of Ser. No. 395,447, Sept. 10, 1973, abandoned. This application July 10, 1975, Ser. No. 594,673

Claims priority, application Austria, Sept. 11, 1972, 7764/72

Int. Cl.² C07C *93/00*

U.S. Cl. 260—570 R 8 Claims

1. A member selected from the group consisting of compounds of the formula



(I)

in which R is alkyl with up to four carbon atoms, R_1 is selected from the group consisting of hydrogen, alkyl containing up to four carbon atoms and benzyl, R_2 is selected from the group consisting of alkenyl containing up to six carbon atoms, aralkenyl, and aralkenyl substituted by a lower alkoxy group, both aralkenyls with the alkenyl group containing up to four carbon atoms, alkinyl containing up to three carbon atoms, cycloalkyl containing up to six carbon atoms and cycloalkylidenemethyl containing up to seven carbon atoms and R_3 is selected from the group consisting of hydrogen and methyl, and a salt thereof.

3,960,961

4'-FLUORO-4- [4-(PHENYL)CYCLOHEXY]-AMINO BUTYROPHENONES AND THE SALTS THEREOF

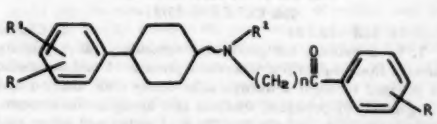
Daniel Lednicer, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 194,544, Nov. 1, 1971, abandoned, which is a continuation-in-part of Ser. No. 68,573, Aug. 31, 1970, abandoned. This application Feb. 2, 1973, Ser. No. 329,044

Int. Cl.² C07C *97/10*

U.S. Cl. 260—570.5 CA 33 Claims

1. A compound of the formula



wherein ~ is a generic expression denoting cis and trans stereoconfiguration and mixtures thereof,

R' and R are selected from the group consisting of hydrogen, alkyl of from one through four carbon atoms, fluo-

rine, chlorine, bromine, trifluoromethyl, nitro and alkoxy of from one through four carbon atoms,

R^1 is selected from the group consisting of hydrogen and alkyl of from one through four carbon atoms and *n* is an integer of from one through six, and acid addition salts thereof.

3,960,962

PROCESS FOR REPLACING THE HYDROXY GROUP OF AN AROMATIC HYDROXY COMPOUND WITH AN AMINE GROUP

Ronald L. Shubkin, West Bloomfield, Mich., assignor to Ethyl Corporation, Richmond, Va.

Filed May 31, 1974, Ser. No. 474,944
Int. Cl.² C07C *85/06*
U.S. Cl. 260—581 **2 Claims**

1. In a process for replacing the hydroxy group of an aromatic hydroxy compound with a $-NH_2$ group, said process comprising reacting said aromatic hydroxy compound with ammonia in the presence of a cyclohexanone promoter and a catalyst at a temperature of about 200°–400°C, the improvement wherein said catalyst is palladium, said palladium being reduced by hydrazine to a metallic state and being bonded to a phosphinated polystyrene resin, said resin being characterized by having the group $-CH_2-P(R)_2$ bonded to phenyl groups in said polystyrene resin wherein R is selected from the group consisting of alkyl, cycloalkyl, aralkyl, alkaryl and aryl.

3,960,963

SEPARATION OF 3,4-DIAMINOTOLUENE FROM A MIXTURE OF o-TOLUENEDIAMINE ISOMERS

David F. Gavin, Chesire, Conn., assignor to Olin Corporation, New Haven, Conn.

Continuation of Ser. No. 417,008, Nov. 19, 1973, abandoned. This application July 29, 1974, Ser. No. 492,648
Int. Cl.² C07C *85/26*
U.S. Cl. 260—582 **5 Claims**

1. A process for separating 3,4-toluenediamine from a mixture of 80–100% o-toluenediamine isomers of which 40-70% is 3,4-toluenediamine and 30-60% is 2,3-toluenediamine comprising: dissolving 10 to 40 grams of said mixture in each 100 cc of a solvent selected from the group consisting of benzene, toluene and xylene at a temperature not above the boiling point of the selected solvent, cooling the resulting solution to a temperature at which precipitation begins, continuing cooling until a desired amount of precipitate is formed, and separating said precipitate to provide a purified 3,4-toluenediamine.

3,960,964

HYDROCARBON UPGRADING PROCESS

Robert M. Suggitt, Wappingers Falls; Walter C. Gates, Jr., Newburgh, and Ralph B. Hudson, Jr., Beacon, all of N.Y., assignors to Texaco Inc., New York, N.Y.

Division of Ser. No. 428,508, Dec. 26, 1973. This application Dec. 13, 1974, Ser. No. 532,354
Int. Cl.² C07C *85/11*
U.S. Cl. 260—583 M **11 Claims**

1. In a process for producing secondary alkyl primary amines from n-paraffins wherein a portion of said n-paraffin is nitrated to form a nitroparaffin along with nitrated and oxygenated by-products, wherein said nitroparaffin is essentially completely hydrogenated to said amine and where said amine is separated from a mixture of unreacted paraffin and oxygenated by-products, the improvement which comprises:

a. catalytically hydrogenating said mixture at a temperature of from about 600° to 750°F. in the presence of a catalyst composed of alumina and a Group VIII metal and from about 10 to 5000 parts per million of nitrogen introduced as ammonia or an organonitrogen compound selected from the group consisting of monoalkylamines, dialkylamines, trialkylamines, nitriles and alkenylpolyamines basis said paraffin mixture; and

b. recycling said hydrogenated product of (a) for nitration with said n-paraffin.

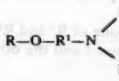
3,960,965

GASOLINE COMPOSITION

John Battersby, Frimley, and Eric Simon Forbes, Lightwater, both of England, assignors to The British Petroleum Company Limited, London, England

Filed Oct. 23, 1973, Ser. No. 408,575
Claims priority, application United Kingdom, Oct. 27, 1972, 49573/72
Int. Cl.² C07C *87/14*
U.S. Cl. 260—584 R **9 Claims**

1. A compound of the formula:



wherein R is a hydrocarbyl group containing from 20 to 500 carbon atoms and derived from the polymerization of isobutylene, R^1 is a polymethylene group containing 2 to 6 carbon atoms interrupted by an imino group, and R^2 and R^3, which may be the same or different are hydrogen atoms or alkyl groups.

3,960,966

KETOISOPHORONE MANUFACTURE

Erich Widmer, Munchenstein, Switzerland, and Marcel Seuret, East Brighton, Victoria, Australia, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed June 19, 1975, Ser. No. 588,274
Claims priority, application Switzerland, June 28, 1974, 8927/74; May 27, 1975, 6747/75
Int. Cl.² C07C *45/00*
U.S. Cl. 260—586 P **10 Claims**

1. A process for the preparation of ketoisophorone which process comprises oxidizing α-isophorone with an oxygen-containing gas in the presence of from about 0.1 to about 10 wt. percent based on the weight of said α-isophorone, of a catalyst selected from the group consisting of phosphomolybdic acid of or salt thereof, silicomolybdic acid or a salt thereof, molybdenum VI dioxybisacetylacetonate, vanadium IV dichlorobisacetylacetonate or vanadium V oxy-dichloromonoacetylacetonate, said oxidation being carried out in the presence or absence of solvent at a temperature of from about 50°C. to 150°C.

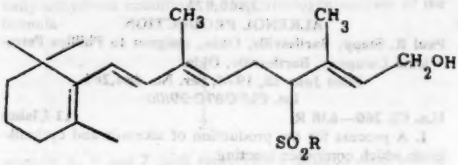
3,960,967

PROCESS FOR PRODUCING A SULFONE DERIVATIVE OF VITAMIN A ALCOHOL

Gary Lee Olson, Westfield, and Gabriel Saucy, Essex Fells, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation-in-part of Ser. No. 398,713, Sept. 14, 1973, abandoned. This application July 19, 1974, Ser. No. 486,145
Int. Cl.² C07C *147/02*
U.S. Cl. 260—607 R **2 Claims**

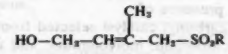
1. A process for producing a compound of the formula:



wherein

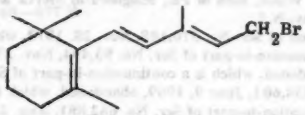
R is unsubstituted aryl, or aryl substituted with an electron donating group;

comprising condensing a sulfone of the formula:

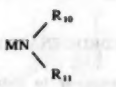


wherein

R is as above; with a derivative of the formula:



in an inert polar organic solvent medium in the presence of a compound of the formula:



wherein

M is an alkali metal and

R_{10} and R_{11} are independently lower alkyl.

3,960,968

METHOD FOR THE CONTINUOUS PRODUCTION OF AQUEOUS DIALKALI SALT SOLUTIONS OF AROMATIC DIHYDROXY COMPOUNDS

Hugo Vernaleken, Krefeld; Ludwig Bottenbruch, Krefeld-Bockum; Gerhard Emmer, Krefeld, and Uwe Hucks, Duisburg, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed June 27, 1974, Ser. No. 483,738

Claims priority, application Germany, July 13, 1973, 2335687

Int. Cl.² C07C *37/00*

U.S. Cl. 260—619 R **12 Claims**

1. A process for continuously producing solutions of dialkali or dialkaline earth metal salts of aromatic dihydroxy compounds, wherein an aromatic dihydroxy compound is sprayed in the form of a melt onto a turbulent liquid film containing the alkali or alkaline earth metal hydroxide in aqueous solution.

3,960,969

METHOD FOR PREPARING AN IMPROVED CREOSOTE WOOD PRESERVATIVE FROM A COAL TAR CREOSOTE BY THE USE OF CAUSTIC COMPOUNDS

Nicholas P. Greco, Pittsburgh, and David A. Webb, Valencia, both of Pa., assignors to Koppers Company, Inc., Pittsburgh, Pa.

Filed Feb. 7, 1975, Ser. No. 547,860

Int. Cl.² C07C *39/06, 37/28*

U.S. Cl. 260—627 H **17 Claims**

1. A method of preparing an improved creosote wood preservative, having a lighter color and reduced tendency for formation of a crud deposit on treated wood, from a coal tar creosote comprising:

a. distilling the coal tar creosote to an end temperature equivalent to a temperature in the range of 395° – 410°C at atmospheric pressure to produce a distillate and a pitch residue, and

b. contacting the distillate with at least 1% by weight of a caustic compound selected from the group consisting of alkali metal alcoholates and alkali metal hydroxides and mixtures of alkali metal alcoholates and hydroxides at a temperature in the range from the melting temperature to the boiling temperature of the creosote whereby an improved creosote wood preservative is produced.

3,960,970

MANUFACTURE OF d,l-METHOL

Heinrich Pasedach, Ludwigshafen, and Albrecht Friederang, Mannheim, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Division of Ser. No. 272,147, July 17, 1972, Pat. No. 3,870,761. This application Feb. 19, 1974, Ser. No. 443,412

Claims priority, application Germany, July 23, 1971, 2136885; Jan. 27, 1972, 2203807

Int. Cl.² C07C *35/12*

U.S. Cl. 260—631 H **7 Claims**

1. In the process for manufacture of d,l-menthol wherein crude piperitenone prepared by reaction of methyl vinyl ketone with mesityl oxide in the presence of a basic catalyst, in which methyl vinyl ketone is slowly introduced into a mixture consisting essentially of excess mesityl oxide and, as the catalyst, 10 to 70% w/w aqueous potassium hydroxide solution, the mixture is brought to a temperature of between 20°C and the reflux temperature, the potassium hydroxide is used in an amount of 0.05 mole to 1.5 mole per mole of methyl vinyl ketone, and the methyl vinyl ketone is introduced into said mixture at said temperature, the steps which comprise hydrogenating the crude mixture of piperitenone and by-products so obtained in the presence of a nickel containing catalyst at a temperature of from 100° to 260°C to give a mixture of d,l-menthol, the menthol isomers neo-menthol, neo-iso-menthol and iso-menthol and hydrogenated by-products of the piperi-

tenone manufacture, separating the resulting hydrogenated mixture by fractional distillation into d,l-menthol said menthol isomers and said hydrogenated by-products, and recovery substantially pure d,l-menthol.

3,960,971

PROCESS FOR PREPARING ALLYLIC ALCOHOLS

William E. Smith, Schenectady, N.Y., assignor to General Electric Company, Pittsfield, Mass.

Filed Mar. 13, 1974, Ser. No. 450,586
Int. Cl.[2] C07C *29/00*
U.S. Cl. 260—638 R 4 Claims

1. A vapor phase process for preparing an allylic alcohol which comprises reacting an allylic ester of a lower carboxylic acid selected from the group consisting of allyl acetate, methallyl acetate or crotyl acetate with a lower alkanol in the presence of a transesterification catalyst which is a mixture of magnesium oxide, magnesium hydroxide and manganese oxide at a temperature of from about 100°C to about 250°C.

3,960,972

ALKENOL PRODUCTION

Paul R. Stapp, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

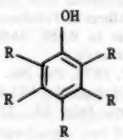
Filed Feb. 14, 1975, Ser. No. 549,889
Int. Cl.[2] C07C *29/00*
U.S. Cl. 260—638 R 6 Claims

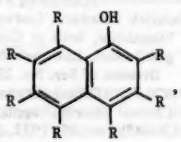
1. A process for the production of alkenols or cycloalkenols which comprises reacting

a. at least one olefinic compound selected from the group consisting of alkenes and cycloalkenes having from 3 to 20 carbon atoms per molecule and at least one allylic hydrogen with

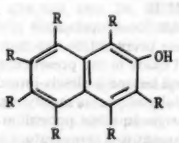
b. formaldehyde in the presence of

c. a yield-promoting amount ranging from about 0.5 to about 50 percent by weight based on formaldehyde charged to the reaction of at least one phenolic compound selected from the group consisting of phenols, 1-naphthols, and 2-naphthols having the general formula





and



wherein R is selected from hydrogen, halogen, alkyl, and alkoxy radicals having 1 to 10 carbon atoms, with the further proviso that the phenol contain a total of from 6 to 36 carbon atoms per molecule and that positions 2-, 4-, and 6- on the ring must be occupied by a substituent other than hydrogen, said reacting being effected under reaction conditions including an elevated temperature and pressure sufficient to produce alkenols or cycloalkenols.

3,960,973

ALKENOL PRODUCTION

Paul R. Stapp, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed June 28, 1974, Ser. No. 484,261
Int. Cl.[2] C07C *29/00*
U.S. Cl. 260—638 R 11 Claims

1. A process for the production of alkenols and cycloalkenols which comprises reacting:

a. at least one alkene or cycloalkene having at least one allylic hydrogen having the basic structure

and having from 3 to 20 carbon atoms per molecule with

b. formaldehyde in the presence of

c. a Group VIB metal carbonyl catalyst selected from the group consisting of chromium, molybdenum, and tungsten metals under reaction conditions including an elevated temperature and pressure sufficient to produce alkenols and cycloalkenols.

3,960,974

4-HALO-2,3,5,6-DIBENZOBICYCLO[5.1.0]OCTANE

Edward L. Engelhardt, Gwynedd Valley, and David C. Remy, North Wales, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 310,188, Nov. 28, 1972, which is a continuation-in-part of Ser. No. 93,494, Nov. 27, 1970, abandoned, which is a continuation-in-part of Ser. No. 834,601, June 9, 1969, abandoned, which is a continuation-in-part of Ser. No. 662,881, Aug. 24, 1967, abandoned, said Ser. No. 310,188, is a continuation-in-part of Ser. No. 59,671, July 30, 1970, abandoned, which is a continuation-in-part of Ser. No. 662,882, Aug. 24, 1967, abandoned. This application Jan. 14, 1975, Ser. No. 540,912
Int. Cl.[2] C07C *25/18*
U.S. Cl. 260—649 R 1 Claim

1. 4-chloro-2,3,5,6-dibenzobicyclo[5.1.0]octane.

3,960,975

MAGNESIUM CHROMITE DEHYDROGENATION CATALYST

Harold E. Manning, Houston, Tex., assignor to Petro-Tex Chemical Corporation, Houston, Tex.

Filed June 3, 1974, Ser. No. 475,608
Int. Cl.[2] B01J *23/26*
U.S. Cl. 252—465 2 Claims

1. A catalyst for use in cyclic dehydrogenation consisting of a compound of the formula, $MeAl_xCr_{2-x}O_4$, where Me is Mg or Mg and one or more of the divalent ions of Ca, Sr, Ba, Fe, Mn, Co, Ni, Cu, Zn, or Cd, provided that Mg comprises at least 50 atomic percent of said Me ions and x is a number of from more than 0 up to less than 1 and the atomic ratio of Al:Cr is 0.04 to 0.8.

3,960,976

METHOD FOR THE SEPARATION OF HYDROCARBONS

Yoshiaki Suzuki, Machida; Hajime Mori, and Takemi Nakanome, both of Yokohama, all of Japan, assignors to Mitsubishi Chemical Industries Ltd., Tokyo, Japan

Filed June 5, 1973, Ser. No. 367,295
Claims priority, application Japan, June 5, 1972, 47-55745; June 26, 1972, 47-63780; July 6, 1972, 47-67737; July 13, 1972, 47-70253; Aug. 2, 1972, 47-77400
Int. Cl.[2] C07C *7/01*
U.S. Cl. 260—674 R 42 Claims

1. A method for separating hydrocarbons which comprises reacting a mixture containing hydrocarbons under substan-

tially anhydrous conditions with a trihalogenoacetate of the formula

wherein X, Y and Z each represents a halogen atom and M represents a monovalent metal of Group Ib to form complexes, separating the formed complexes as a solid from the mixture which also contains non-complexed hydrocarbons by distillation, and then decomposing the solid complexes by bringing the same into contact with water to separate the desired hydrocarbons, wherein said hydrocarbons are selected from the group consisting of aromatic hydrocarbons substituted by hydrocarbyl groups and condensed polycyclic hydrocarbons.

3,960,977

PROCESS FOR THE PREPARATION OF POLY-UNSATURATED HYDROCARBONS

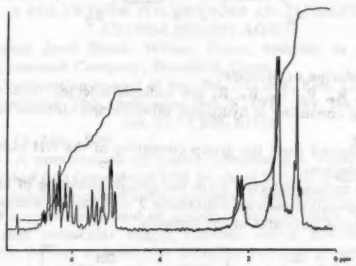
Ferdinand Naf, Geneva; Gunther Ohloff, Bernex-Geneva, and Albert Eschenmoser, Kusnacht, all of Switzerland, assignors to Firmenich S.A., Geneva, Switzerland

Filed May 24, 1974, Ser. No. 473,087

Claims priority, application Switzerland, June 7, 1973, 8247/73

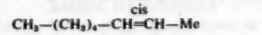
Int. Cl.² C07C *11/21*

U.S. Cl. 260—677 R **3 Claims**



1. Process for the preparation of undeca-1,3trans,5cis-triene, which comprises

a. adding an organo-metallic compound of formula

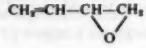


VI

wherein Me represents

1. an alkali metal; or
2. a radical consisting essentially of a transition metal and an univalent cation

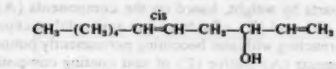
to a compound of formula



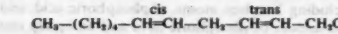
VII;

at a temperature below about room temperature,

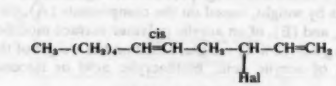
b. halogenating the thus obtained alcohols of formula



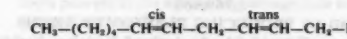
and of formula



to obtain a halo-derivative of formula



and of formula



and subsequently

(c) dehydrohalogenating the thus obtained halo-derivatives to give pure undeca-1,3trans,5cis-triene.

3,960,978

CONVERTING LOW MOLECULAR WEIGHT OLEFINS OVER ZEOLITES

Edwin N. Givens, Pitman; Charles J. Plank, Woodbury, and Edward J. Rosinski, Deptford, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Sept. 5, 1974, Ser. No. 503,420

The portion of the term of this patent subsequent to Aug. 6, 1991, has been disclaimed.

Int. Cl.² C07C *3/20*

U.S. Cl. 260—683.15 R **12 Claims**

1. A process for producing a gasoline fraction having therein no more than about 20% by weight of aromatics, said process comprising contacting a C_2–C_5 olefin, mixtures thereof or mixtures thereof with paraffins having from 1 to 5 carbon atoms with a crystalline aluminosilicate zeolite selected from the group consisting of ZSM-5 and ZSM-11 and having an α-value of from about 0.1 to about 120, at a WHSV of from about 0.1 to about 25 and at a temperature of from about 500°F to about 900°F, whereby said gasoline fraction containing predominantly higher olefins is obtained.

3,960,979

HIGH SOLIDS CAN COATING COMPOSITIONS BASED ON EPOXY RESIN CROSSLINKING AGENT, FLEXIBILIZING POLYOL, CO-REACTIVE ACID CATALYST, AND SURFACE MODIFIER

Ram Tirth Khanna, Linden Heath, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 24, 1974, Ser. No. 536,323

Int. Cl.² C08L *63/00*

U.S. Cl. 260—834 **14 Claims**

1. A high solids coating composition consisting essentially of

A. 30–65 parts by weight, based on the components (A), (B), (C), (D), and (E), of an epoxy resin containing at least two epoxy groups per molecule and having a molecular weight not exceeding 2,500;

B. 10–35 parts by weight, based on components (A), (B), (C), (D), and (E), of a nitrogen resin crosslinking agent;

C. 20–40 parts by weight, based on the components (A), (B), (C), (D), and (E), of a polyol, selected from the group consisting of: polyester polyol and polyether

polyol, having a minimum of two hydroxyl groups per molecule, a molecular weight range of 100–4000, and a hydroxyl number range of 15–560;

D. 0.5–10 parts by weight, based on the components (A), (B), (C), (D), and (E), of at least one acid catalyst capable of co-reacting with and becoming permanently bound to components (A) and/or (C) of said coating composition selected from the group consisting of

1. phosphoric acid;
2. an alkyl, cycloalkyl or aryl mono-ester containing up to and including 7 carbon atoms, of phosphoric acid; and
3. a mono-adduct of phosphoric acid and an epoxy resin containing at least two epoxy groups per molecule and having a molecular weight not exceeding 2,500; and

E. 0–2 parts by weight, based on the components (A), (B), (C), (D), and (E), of an acrylic polymer surface modifier containing 0.5–10% by weight, based on the weight of the polymer, of acrylic acid, methacrylic acid or itaconic acid.

3,960,980

METHOD OF PRODUCING ELASTOMER RESINS

Toshio Yukuta; Takashi Ohashi, both of Kodaira; Yoshiko Taniguchi, Higashi-Murayama, and Masumi Saito, Tanashi, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Continuation of Ser. No. 307,408, Nov. 17, 1972, abandoned. This application Dec. 16, 1974, Ser. No. 533,220

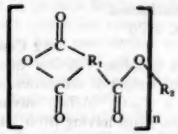
Claims priority, application Japan, Nov. 22, 1971, 46-93785

Int. Cl.² C08G *45/06, 45/12*

U.S. Cl. 260—835 **7 Claims**

1. A method for producing elastomer resins which comprises

reacting at least one acid anhydride group functional polymer having the following formula



wherein R_1 is a trivalent group having at least two carbon atoms, R_2 is a hydroxyl group functional polymer residue and *n* is an integer of at least 2, which is prepared by reacting a hydroxyl group functional polymer having a number average molecular weight of 400 to 10,000 and containing at least two hydroxyl groups at the ends or the side chains with a tricarboxylic acid anhydride monohalide,

with at least one bifunctional nitrogen compound having primary amino groups as a chain extender at an equivalent ratio of said acid anhydride group to nitrogen group of 1:1

at a temperature of 40°–200°C to form a carboxyl-functional polymer and

then reacting said carboxyl-functional polymer with at least one epoxy resin having at least two epoxy groups.

3,960,981

MIXTURES OF VINYL ESTER RESINS

Silvio Vargiu, Sesto S. Giovanni (Milan); Edoardo Carpaneti, Genoa Bolzaneto, and Beppino Passalenti, Milan, all of Italy, assignors to Societa' Italiana Resine S.I.R. S.p.A., Milan, Italy

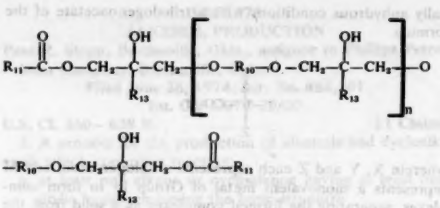
Filed Dec. 27, 1974, Ser. No. 536,737

Claims priority, application Italy, Dec. 28, 1973, 32341/73

Int. Cl.² C08L *63/10*

U.S. Cl. 260—837 R **5 Claims**

1. An unsaturated organic solvent solution of a mixture of polyesters comprising a first polyester of the formula:



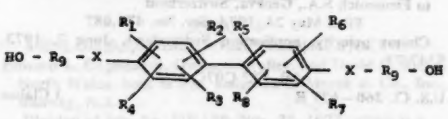
wherein:

n is an integer from 0 to 15,

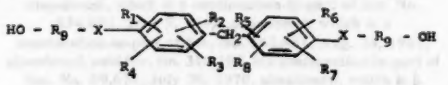
R_{13} is a radical selected from the group consisting of H and CH_3,

is a member of the group consisting of ethylenically unsaturated monocarboxylic acids and monoesters ethylenically unsaturated dicarboxylic acids,

R_{10} is the organic radical of a glycol HO-R_{10}-OH selected from the group consisting of:



and



wherein:

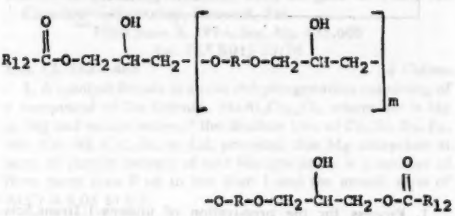
R_1 is chlorine or bromine;

R_2, R_3, R_4, R_5, R_6, R_7, R_8 are radicals selected from the group consisting of hydrogen, bromine and chlorine radicals,

X is selected from the group consisting of the NH radical and oxygen,

R_9 is a radical selected from the group consisting of alkyl and oxyalkyl radicals containing 2 to 8 carbon atoms;

and a second polyester of the formula:



wherein:

m is an integer from 0 to 20

R is the bisphenyl radical corresponding to the bisphenol A

is a member of the group consisting of ethylenically unsaturated monocarboxylic acids and monoesters of ethylenically unsaturated dicarboxylic acids

said first polyester being present in the solution in a weight ratio of said first polyester to said second polyester of from 1:100 to 30:100.

3,960,982

THERMOSETTING RESINS

Shunichi Numata, Hitachi; Hitoshi Yokono, Katsuta; Junji Mukai, Hitachi; Tadashi Muroi, Kokubunji; Mineo Nakano, and Mikio Manabe, both of Hitachi, all of Japan, assignors to Hitachi, Ltd. and Hitachi Chemical Company, Ltd., both of Japan

Filed June 18, 1974, Ser. No. 480,474
Claims priority, application Japan, June 21, 1973, 48-70596
Int. Cl.² C08L 61/34, 61/08
U.S. Cl. 260—838 9 Claims

1. A thermosetting resin mixture composition which comprises a first thermosetting resin prepared by reacting with a formaldehyde source selected from the group consisting of formaldehyde, paraformaldehyde, trioxane, and polyoxymethylene in the presence of a basic catalyst a modified novolak-type resin obtained by reacting a mono or multi-valent phenolic compound having at least two active hydrogen atoms with an aralkyl ether or alcohol represented by the general formula $R(CH_2OR')_n$ or an aralkyl halide represented by the general formula $R(CH_2X)_n$, wherein R is a group selected from phenyl, diphenyl ether, diphenyl methane, diphenyl ketone, diphenyl sulfone and naphthalene groups and substituted groups thereof, R′ is a hydrogen atom or an alkyl group having 1 to 4 carbon atoms, X is a halogen atom, and n is 2 to 3, and a second thermosetting resin prepared by blending the above-mentioned modified novolak-type resin with hexamethylenetetramine, the amount of said first resin being 20 to 80 parts by weight, and the amount of said second resin being 80 to 20 parts by weight.

3,960,983

COMPOSITION OF MATTER COMPRISING A BLEND OF A POLYETHER POLYOL AND AN AMINOPLAST CROSS-LINKING AGENT

Werner Josef Blank, Wilton, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 331,406, Feb. 12, 1973, abandoned. This application Dec. 6, 1974, Ser. No. 530,459
Int. Cl.² C08L 61/28
U.S. Cl. 260—839 15 Claims

1. A composition of matter comprising a water-dilutable blend of (A) from about 10% to about 90% of a water-dilutable, polyether polyol resin, containing only carbon, hydrogen and oxygen atoms and optionally a halogen atom, having an average molecular weight between about 250 and about 2,000, having at least two alcoholic hydroxy groups, having from about 80% to about 20%, by weight, of hydrophobic moieties derived at least in part from aromatic or cycloaliphatic materials and correspondingly from about 20% to about 80%, by weight, of hydrophilic moieties consisting of $-(CH_2CH_2-O-)$ units and (B) correspondingly from about 90% to about 10%, by weight, of a compatible aminoplast cross-linking agent having an average molecular weight not greater than 1,000.

3,960,984

COMPOSITION OF OXYMETHYLENE POLYMER AND AMIDE OLIGOMERS

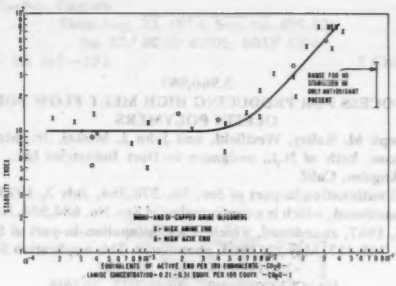
Melvin Ira Kohan, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 16, 1974, Ser. No. 461,388
Int. Cl.² C08L 77/02
U.S. Cl. 260—857 F 19 Claims

1. A composition of matter comprising

A. 90% to 99.99% by weight of an oxymethylene homopolymer or copolymer comprised of at least 60% by weight of oxymethylene segments, and

B. 10 to 0.01% by weight a dicapped amide oligomer having a molecular weight of between 800 to 10,000 wherein the active ends of said oligomer constitute no more than 0.02



mole percent of the formaldehyde segments in said homopolymer or copolymer.

3,960,985

POLYPHENYLENE ETHER-RESIN COMPOSITIONS WITH ORGANOPOLYSILOXANES HAVING SILICON-H-BONDS

Glenn D. Cooper, Delmar, N.Y., assignor to General Electric Company, Pittsfield, Mass.

Filed Feb. 8, 1974, Ser. No. 440,759
Int. Cl.² C08L 71/04, 25/06, 83/06
U.S. Cl. 260—874 16 Claims

1. A thermoplastic molding composition which comprises:

A. from 20 to 80 parts by weight of a polyphenylene ether resin;

B. from 80 to 20 parts by weight of an alkenyl aromatic resin; and

C. from 0.25 to 2 parts by weight of an organopolysiloxane of the formula

$$(R')_a(H)_bSiO_{\frac{4-a-b}{2}}$$

wherein R′ is an organic radical attached to silicon through silicon-carbon linkages, *a* has a value of 1.0 to 2.5, inclusive; *b* has a value of from 0.005 to 2.0, inclusive; and the sum of *a* plus *b* is equal to from 1.005 to 3.0, inclusive.

3,960,986

IMPACT-RESISTANT MOLDING COMPOSITIONS CONTAINING POLYVINYL CHLORIDE

Friedrich Heichele; Georg Vojtechovsky; Georg Hollenbach; Klaus Adler, and Johann Bauer, all of Burghausen, Germany, assignors to Wacker-Chemie GmbH, Munich, Germany

Filed July 3, 1974, Ser. No. 485,325
Claims priority, application Germany, July 13, 1973, 2335734
Int. Cl.² C08L 51/00, 23/00, 91/06
U.S. Cl. 260—876 R 3 Claims

1. A molding composition giving a homogenous molded form having a high resistance to impact consisting essentially of

A. from 40% to 70% by weight of a polyvinyl chloride having a K-value of from 55 to 70,

B. from 26% to 56% by weight of a vinyl chloride grafted copolymer of ethylene and vinyl acetate, said copolymer having a content of from 30% to 55% by weight of vinyl acetate units and a Mooney viscosity of from 20 to 50, said vinyl chloride grafted copolymer having a content of from 5% to 15% by weight of said copolymer units and a K-value of from 55 to 70, and

C. from 1% to 4% by weight of a copolymer of ethylene and vinyl acetate having a content of from 60% to 70% by

weight of vinyl acetate units and a Mooney viscosity of 10 to 70.

3,960,987

PROCESS FOR PRODUCING HIGH MELT FLOW POLYOLEFIN POLYMERS

Joseph M. Kelley, Westfield, and John J. Miskel, Jr., Mendham, both of N.J., assignors to Dart Industries Inc., Los Angeles, Calif.

Continuation-in-part of Ser. No. 376,264, July 3, 1973, abandoned, which is a continuation of Ser. No. 684,594, Nov. 13, 1967, abandoned, which is a continuation-in-part of Ser. No. 369,417, May 22, 1964, abandoned. This application Sept. 23, 1974, Ser. No. 508,137

Int. Cl.² C08F *2/02, 2/06, 2/38, 297/08*

U.S. Cl. 260—878 B **3 Claims**

1. A polymerization process for preparing a waxy block copolymer of propylene which consists essentially in polymerizing (said) propylene in liquid form employing as a catalyst a crystalline titanium trichloride cocrystallized with aluminum chloride and diethylaluminum monochloride as a cocatalyst, said polymerization being carried out at a rate of at least 300 pounds of polymer per pound of catalyst per hour based on the titanium trichloride and in the presence of a hydrogen partial pressure of about (300) 150 psia to about 1000 psia and at a reaction pressure of about 375 psia to about 5000 psia sufficient to maintain said propylene in liquid form during said polymerization to produce a homopolymer having an inherent viscosity of from 0.05 to 0.7 in decalin at 145°C and a melt flow of from 1000 to 5000 gms/10 min. as determined by ASTM D-1238-62T at 230°C using a load of 2160 grams, contacting said homopolymer which still contains active catalyst residues with at least one additional alpha-olefin monomer to form a subsequent polymer block attached to said homopolymer selected from the group of polyethylene (or) and a random ethylene-propylene copolymer and recovering from said polymerization a waxy block copolymer having a melt flow ranging from 40 to 400 gms/10 min. as determined by ASTM-D-1238-62T at 230°C using a load of 2160 grams.

3,960,988

VULCANIZATION OF BROMOBUTYL

Eric George Kent, and John Walker, both of Sarnia, Canada, assignors to Polysar Limited, Ontario, Canada

Continuation-in-part of Ser. No. 396,146, Sept. 11, 1973. This application Nov. 22, 1974, Ser. No. 526,254

Int. Cl.² C08L *9/00, 47/00*

U.S. Cl. 260—879 **7 Claims**

1. A composition vulcanizable by the action of heat which comprises 100 parts by weight of a halogenated polymer of an isoolefin, from about 5 to about 50 parts by weight of a monomeric organic compound and 0.1 to 5 parts by weight of a free radical organic peroxidic curing agent, said halogenated polymer of an isoolefin being a polymer containing, based on hydrocarbon content, from 85 to 99.5 weight percent of an isoolefin having from 4 to 8 carbon atoms and from 0.5 to 15 weight percent of a conjugated diolefin having from 4 to 8 carbon atoms, and having been treated to contain a halogen selected from chlorine and bromine, said halogen being present in said polymer up to 1 atom of chlorine or up to 3 atoms of bromine per carbon-carbon double bond in said polymer, said monomeric organic compound having at least two polymerizable ethylenically unsaturated groups and being curable by said curing agent.

3,960,989

COLLOIDAL SOL ANTIMONY PENTAOXIDE FLAMEPROOFING COMPOSITIONS

Henry G. Petrow, 33 Concord Ave., Cambridge, Mass. 02138, and Robert J. Allen, 130 Adams Ave., Saugus, Mass. 01906

Division of Ser. No. 212,375, Dec. 27, 1971, Pat. No. 3,860,523. This application Nov. 21, 1974, Ser. No. 526,058

Int. Cl.² C08J *3/20*

U.S. Cl. 260—884 **6 Claims**

1. A flame retardant comprising a colloidal sol of Sb_2O_5 having colloidal particle size ranging from substantially 20 Angstroms to 1/10 micron and in which an effective amount of a halogen is added.

2. A flame-retardant as claimed in claim 1 and in which the ratio of halogen-to-antimony lies within the range of from substantially 1–4 to 20–1.

3. A flame-retardant as claimed in claim 2 and in which the halogen is chlorine.

4. A flame-retardant as claimed in claim 3 and in which the chlorine is contained in a compound selected from the group consisting of polyvinyl chloride, polyvinylidene chloride, and copolymers and mixtures of the same.

3,960,990

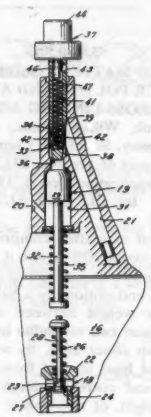
CARBURETOR POWER VALVE CONTROL APPARATUS

Gerald B. Bishop, Dearborn, and David J. Gladden, Garden City, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Aug. 5, 1974, Ser. No. 490,161

Int. Cl.² F02M *1/10*

U.S. Cl. 261—39 A **1 Claim**



1. Power valve control apparatus for a carburetor having an induction passage, a fuel bowl, fuel passage means interconnecting said fuel bowl and said induction passage, an air cleaner positioned on said carburetor over said induction passage,

power valve means opening into said fuel passage from said fuel bowl,

said power valve means having an element movable to open and close said fuel passage,

a vacuum motor for displacing said movable element in response to changes in intake manifold vacuum,

said vacuum motor comprising a first bore formed in the carburetor housing,

a piston slidably received within said first bore,

said piston having one side subject to a vacuum signal and the other side subject to more nearly atmospheric pressure,

said piston being constructed to permit air flow from the atmospheric side of the piston to the vacuum side,

said piston including an element extending into said fuel bowl and being engageable with the movable element of said power valve means,

a variable volume chamber within said first bore on one side of said piston,

a second bore axially aligned with said first bore leading from said chamber,

said second bore and said first bore separated by a reduced diameter portion,

a thermostatic valve assembly including a stem portion received within said second bore,

the end of said stem portion being tapered and received within said reduced diameter portion,

said stem portion being axially displaceable relative to said reduced diameter portion to vary the effective opening between said first bore and said second bore,

an air bleed passage axially formed within said stem portion in communication with said second bore,

a port formed in said stem portion communicating the air bleed passage and the interior of the air cleaner,

said port, air bleed passage and bore communicating said chamber with the interior of said air cleaner,

said valve assembly including a temperature sensitive power means having a movable element axially slidable within said air bleed passage to progressively open and close said port in response to changes in air temperature within the air cleaner.

3,960,991

ROTARY AERATOR

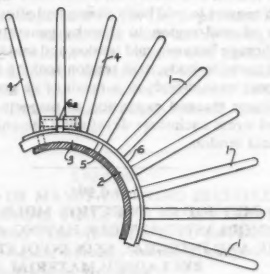
Walti Schmitt, Wiesbaden-Biebrich, and Philipp Kreiner, Taunusstein-Hahn, both of Germany, assignors to Passavant-Werke Michelbacher Hutte, Germany

Filed June 3, 1974, Ser. No. 475,953

Claims priority, application Germany, July 25, 1973, 2337804

Int. Cl.[2] F24F *5/00;* **B05B** *3/12*

U.S. Cl. 261—92 **16 Claims**



1. An elongated horizontal rotor for introducing gases into fluids comprising:

a. a plurality of axially arranged hub members mounted in close sequence along the axial length of the rotor and extending transversely of the axis of rotation of the rotor and being formed of a synthetic plastic material with each hub member comprising segments of a cylindrical sleeve-like member connected to each other,

b. a plurality of radially extending, synthetic plastic agitator elements molded integrally with each said hub member to form an integral star-shaped unit,

c. means detachably interlocking adjacent vertical faces of said hub members to each other, and

d. clamping means detachably connecting said hub members to said rotor.

3,960,992

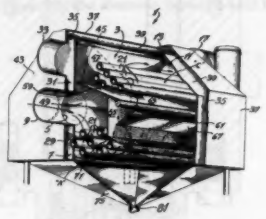
COMBINATION FLUE GAS SCRUBBER AND HEAT EXCHANGER UNIT

Henri-Paul Cyrenne, 34, Boulevard de l'Artisan, Victoriaville, Quebec, Canada

Filed Aug. 22, 1974, Ser. No. 499,526

Int. Cl.[2] B01D *47/06;* **B01F** *3/04*

U.S. Cl. 261—152 **7 Claims**



1. A combination flue gas scrubber and heat exchanger unit comprising:

a. an inner closed casing having a flue gas inlet end wall and a flue gas outlet end wall spaced from one another; side walls between said end walls; a top wall joining said side and end walls and a bottom wall shaped as a water collecting basin and joining said side and end walls;

b. chamber defining means in said casing comprising: lateral walls extending fully between said end walls in inwardly spaced relationship with said casing side walls and terminating short of said top and bottom walls to define flue gas lateral passages communicating at the lower ends thereof with said water collecting basin; an upper wall over and joining said lateral walls and said end walls to define an upper chamber in communication with the upper ends of said lateral passages and an open-bottom inner chamber in communication with said water collecting basin and the lower ends of said lateral passages;

c. flue gas inlet means at said flue gas inlet end wall feeding hot flue gases into said inner chamber and flue gas outlet means at said flue gas outlet wall drawing cooled flue gases out of said upper chamber;

d. baffle members mounted in succession in said lateral passages to force said flue gases to follow a tortuous path between said lower and upper chambers, each baffle having a free outer edge overlapping the outer edges of adjacent baffle members;

e. water sprinkling means mounted, in each lateral passage, on the upper one of said successive baffle members therein beneath the outer edge thereof sprinkling water over the outer edges of the succeeding baffle members whereby to form water curtains in said passages for the scrubbing of said flue gases, the water from said curtains dripping into said water collecting basin;

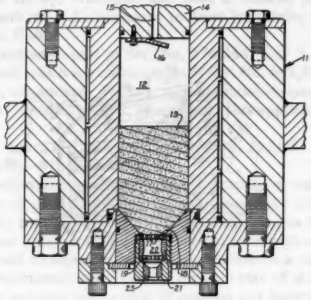
f. water feed means joining said basin and said sprinkling means to supply water to said sprinkling means, and

g. air conduit means including air conduits extending across said lower and upper chambers for heat exchange between air flowing therethrough and flue gases passing through said chambers and around said conduits.

3,960,993
METHOD FOR EXTRUDING SOLVENTLESS GUN POWDER

Craig E. Johnson, Indian Head, and John R. Luense, Marlow Heights, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 27, 1975, Ser. No. 553,719
Int. Cl.² C06B 21/00
U.S. Cl. 264—3 B **4 Claims**



1. A process for increasing the tensile strength of solventless gun powder comprised, by weight, of about 46 percent nitrocellulose, about 38 percent metriol tri-nitrate, and about 3 percent of tri-ethylene glycol di-nitrate, with the balance being plasticizers and stabilizers, which process comprises the steps of

first extruding said solventless gun powder through a multi-hole plate,

then reforming said solventless gun powder into a mass,

then again extruding said solventless gun powder through a multi-hole plate,

then again reforming said solventless gun powder into a mass, and

finally extruding said solventless gun powder through a single hole die to form a single strand of solventless gun powder having increased tensile strength wherein said steps are carried out in a vacuum press under a vacuum condition.

3,960,994
PREPARATION OF HIGH TEMPERATURE GAS-COOLED REACTOR FUEL ELEMENT

Ronnie A. Bradley, Oak Ridge, and John D. Sease, Knoxville, both of Tenn., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

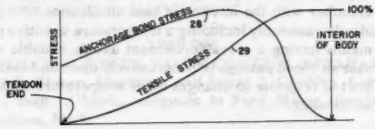
Filed Nov. 26, 1974, Ser. No. 527,470
Int. Cl.² G21C 21/00
U.S. Cl. 264—.5 **2 Claims**

1. An improved method for making nuclear fuel composites comprising the steps of loading a plurality of respective graphite tubes with a plurality of respective green compacts consisting of a dispersion of a nuclear fuel oxide or carbide microspheres coated with pyrolytic carbon within a pitch matrix, inserting graphite plugs into both ends of each respective graphite tube after said loading step, placing said tubes in an open container, inserting said container into an autoclave, after which the pressure within said autoclave is raised to a selected pressure in the range 5,000–15,000 psi at room temperature using argon gas, heating said autoclave after the selected pressure has been reached at about 100°C/hour to a temperature of 700°C while at the same time venting said gas to maintain said selected pressure, maintaining said 700°C temperature and said selected pressure for about 2 hours to assure equilibrium temperature in the tubes and to allow carbonization of the matrix pitch to reach completion, then cooling said autoclave under pressure to room temperature, removing said pressure and then removing said container from said autoclave, placing said container in a furnace where the tubes in said container are heated in an argon atmosphere to 1800°C, and finally, after cooling, removing the heat-treated fuel compacts from the graphite tubes.

3,960,995
METHOD FOR PRESTRESSING A BODY OF CERAMIC MATERIAL

Jacques P. Kourkene, 27057 Horseshoe Lane, Los Altos Hills, Calif. 94022

Continuation of Ser. No. 37,417, May 13, 1970, abandoned, which is a continuation of Ser. No. 639,532, May 18, 1967, abandoned. This application Apr. 17, 1972, Ser. No. 244,977
Int. Cl. B28b 23/04
U.S. Cl. 264—27 **33 Claims**



1. A method for producing a prestressed ceramic body with an elongate tendon, comprising the steps of:

a. positioning said tendon in said body, said tendon having a greater coefficient of linear thermal expansion than the material of said body,

b. elevating the temperature of said tendon and the region of said body immediately surrounding said tendon to at least the softening temperature of the material of the body so that said tendon elongates and undergoes differential thermal expansion with respect to said body,

c. lowering the temperature of said tendon and the region of said body immediately surrounding said tendon so that said tendon contracts with a minimum degree of slippage with respect to said body during and after the resolidification of said region to thereby generate a bond stress anchorage between said tendon and said body to prestress said ceramic body, said tendon seeking to contract with respect to said body as a result of its greater coefficient of linear thermal expansion as respects said body, said bond stress anchorage developing the entire tensile force in said tendon.

3,960,996
METHOD OF INJECTION MOLDING A THERMOPLASTIC ARTICLE HAVING A CELLULAR CORE AND INTEGRAL SKIN INVOLVING USE OF RECLAIMED MATERIAL

Anguel Tonchev Balevski; Ivan Dimov Nikolov; Asparuh Mihailov Antonov, and Stefan Georgiev Semerdjiev, all of Sofia, Bulgaria, assignors to Institut po Metaloznanie i Technologia na Metalite, Sofia, Bulgaria

Filed Sept. 21, 1973, Ser. No. 399,512
Int. Cl.² B29D 27/00; B29F 1/04
U.S. Cl. 264—37 **2 Claims**

1. A method of producing thermoplastic bodies with a cellular core and an integral skin, comprising the steps of:

a. forcing a plasticated foamable non-expanded thermoplastic material in a liquid state into a vertical cylinder at a pressure sufficiently high to prevent foaming;

b. then injecting said foamable non-expanded thermoplastic material in a liquid state into a closed mold cavity against a gas counter-pressure sufficiently high to prevent foaming;

c. allowing a surface portion only of said foamable non-expanded thermoplastic material injected in step (b) to

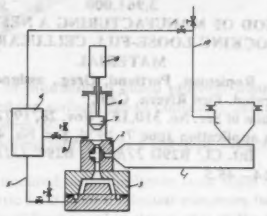
solidify under pressure so as to take on the shape of said mold cavity and form a compact skin;

d. relieving the pressure from said foamable thermoplastic material subsequent to step (c) so as to allow the foaming of the still unsolidified remainder of said material in the interior of the mold cavity, releasing an excess of the foaming material out of said mold cavity into said vertical cylinder, and thereby completing the formation of a molded body in said mold cavity;

e. removing the molded body from said mold cavity;

f. recompressing said excess foamed material within said vertical cylinder for use as a second charge in a next subsequent molding cycle;

g. forcing a further quantity of plasticated foamable but non-expanded thermoplastic material into said vertical cylinder against the recompressed material of step (f) at a pressure sufficiently high to prevent foaming;



h. injecting the material stored in said vertical cylinder into said closed mold cavity against a gas counterpressure sufficiently high to prevent foaming by first introducing into the mold cavity fresh non-expanded material from the lower part of the vertical cylinder and finally filling the mold cavity with the recompressed foamed material from the previous molding and as stored in the upper part of the vertical cylinder, the latter filling only part of the interior of the molded body causing no damage to its surface;

i. repeating the steps from (c) to (h) to produce a succession of molded bodies, said mold cavity being charged with 50 to 90 percent of its volume with plasticated unfoamed thermoplastic material for each of said bodies, the remainder of the volume of said mold cavity being filled up with recompressed excess foamed material from the previous molded body.

3,960,997

METHOD OF MANUFACTURING BIAXIALLY STRETCHED SHRINK FOILS AND AN APPARATUS FOR CARRYING THE METHOD INTO EFFECT

Leif Brunswig Sorensen, Horsens, Denmark, assignor to Horsens Plastic A/S, Horsens, Denmark

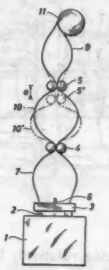
Continuation-in-part of Ser. No. 284,542, Aug. 29, 1972, abandoned. This application June 24, 1974, Ser. No. 482,673

Claims priority, application Denmark, Aug. 31, 1971, 4263/71

Int. Cl.² B29D 7/24, 23/04

U.S. Cl. 264—40 **10 Claims**

1. A method of biaxially orienting plastic material comprising the steps of extruding a length of molten orientable plastic material in tubular form from the orifice of an extruder and passing the extruded length between opposing rollers of each of a first set and a second set of roller pairs of which the opposing rollers of at least said first pair are sufficiently separated that the tubing length is not pinched closed by the separated rollers, said first and second sets of roller pairs being spaced-apart and movable relative to the extruder orifice in the direction of the extruded tubing length with said first set being nearest said extruder orifice, introducing gas under pressure into the interior of said extruded length of tubing from within the orifice of said extruder and directing cooling air toward said first set of roller pairs along the exterior wall of the molten tubing leaving said extruder orifice to cool the tubing to an orientable temperature, clamping together the separated, opposing rollers and pinch closed the gas filled tubular length at the respective spaced-apart roller set locations to form a plurality of bubbles in the length of tubing of which a first bubble lies between said extruder orifice and the first set of said roller pairs and a second bubble lies between said two sets of roller pairs, rotating the rollers of each set of roller pairs at different velocities with the rollers of the second set of roller pairs rotating at a sufficiently higher velocity than the rollers of said first set that the tubing between said two sets of rollers is stretched in its lengthwise dimension a predetermined amount, adjusting the distance between said first set of



roller pairs and said extruder orifice such that said first bubble is cooled an amount to establish said second bubble at an optimum temperature for orientation stretching and decreasing the distance between said two sets of roller pairs to a shortened optimum spacing as will increase the pressure of the gas within said second bubble an amount to expand the bubble to that predetermined diameter as will stretch the tube an amount in its transverse dimension to create a predetermined ratio between the amount of stretch established in the lengthwise and in the transverse dimensions of the fully stretched tube, and maintaining that optimum spacing between said first set of roller pairs and said extruder orifice and between said two sets of roller pairs as will maintain said second bubble optimum orientation temperature and will maintain said predetermined second bubble diameter while continuing to extrude said length of tubing passing through said sets of rollers clamped thereon.

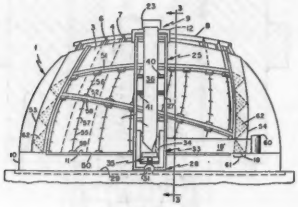
7. An apparatus for biaxially orienting plastic material comprising an extruder from the orifice of which a length of molten orientable plastic tubing is extruded, two sets of pairs of rollers spaced from said extruder orifice at different distances in line with said tubing length, each said set of rollers including a pair of opposing rollers mounted for movement toward and away from each other between a retracted position at which a sufficient space exists between the rollers of said tubing length to pass therethrough without being pinched closed and a clamped position in which the rollers are tightly pressed together to pinch closed the tubing length therebetween, means within the orifice of said extruder for introducing a gas under pressure into the interior of the length of tubing extruded therefrom, means circumscribing said tubing immediately adjacent said extruder orifice for blowing cooling air along the exterior surface of said tubing in the direction of said first set of roller pairs, means for rotating the rollers of each set of rollers at a predetermined and different velocity, the rollers of the set of rollers most remote from said orifice rotating at a higher velocity than the other set of rollers nearest the extruder, and means supporting each of said roller sets for movement of each said set along the length of the tubing toward or away from said extruder orifice and adjusting the location of said roller sets to give optimum orientation of the

tubing being drawn into a film between the rollers of said sets, said support means supporting at least one of said roller sets within a cut-out in a platform supported for movement relative to the other roller set by a plurality of threaded rods extending through holes in said platform.

3,960,998
METHOD FOR PRODUCING LARGE RIGID FOAM PANELS

Samuel B. Allen, B-2 Gypsy Hill Road, Landenberg, Pa. 19350

Division of Ser. No. 879,802, Nov. 25, 1969, abandoned. This application Oct. 4, 1971, Ser. No. 186,190
Int. Cl. B29D *27/04*
U.S. Cl. 264—45.1 **2 Claims**

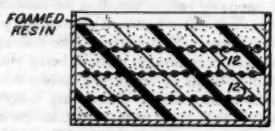


1. A method for making relatively large rigid foam panels comprising, the steps of:
providing a form surface which defines the shape of the panel,
feeding frothing urethane foam onto a ribbon,
laying down a first length of the ribbon on the form surface with the foam coated side of the ribbon against the form surface,
laying additional lengths of the ribbon on the form surface in the same manner alongside the first length and side by side in courses sufficiently close in order that the foam coatings flow between the courses and cohere together while still tacky,
causing the foam to cure so that the courses of foam form an integral layer of rigid material and
removing the cured foam panel from the form surface.

3,960,999
METHOD OF PRODUCING REINFORCED FOAMED STRUCTURES

Stephen N. Massie, Palatine, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Nov. 11, 1974, Ser. No. 522,673
Int. Cl.² B29D *27/04*
U.S. Cl. 264—45.3 **6 Claims**

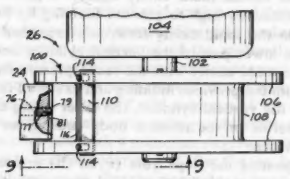


1. Method of producing a foamed thermosetting resinous structure having a plurality of layers of spaced reinforcement material positioned within its thickness comprising the steps of:
providing mesh-like reinforcement material;
covering the mesh-like reinforcement material with an absorbent covering material capable of absorbing the resin used to form the foamed structure so as to define a plurality of openings through the covered reinforcement material;
placing a plurality of layers of said absorbent covered reinforcement material in the bottom of a mold, the reinforcement material in each of said layers being positioned so that a liquid resin composition may pass through said openings;
adding sufficient quantity of a foamable liquid thermosetting resin composition to the mold for forming the desired foamed thermosetting resin structure;
allowing sufficient time for the absorbent covering material to become completely wetted by said liquid resin composition material; and
foaming and curing said liquid resin composition in the mold to cause it to lift said layers of reinforcement material and cause them to move away from each other and become embedded in spaced apart relationship in the foamed thermosetting resin structure.

3,961,000
METHOD OF MANUFACTURING A NESTING OR INTERLOCKING LOOSE-FILL CELLULAR PACKING MATERIAL

Richard L. Ropiequet, Portland, Oreg., assignor to Altainer Incorporated, Pico Rivera, Calif.

Continuation of Ser. No. 310,151, Nov. 28, 1972, abandoned. This application June 7, 1974, Ser. No. 477,298
Int. Cl.² B29D *27/00*; **; B29C** *17/10*
U.S. Cl. 264—45.5 **7 Claims**

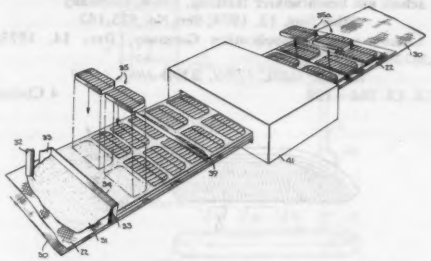


1. A method of making low bulk density loose-fill packing material having a nesting or interlocking configuration from a molten expandable synthetic plastic composition, comprising the sequential steps of
a. continuously extruding said composition at a pressure exceeding atmospheric pressure through a die orifice into a region of atmospheric pressure with a lesser flow velocity adjacent the walls of the die bore leading to said die orifice and with such extrusion producing at said orifice, where it faces said region of atmospheric pressure, a protruding mass of said molten material bounded by a convex surface that extends from the perimeter of the orifice in a partial spherical sweep,
b. repetitively cutting off said protruding mass at said orifice as it continuously extruded and while the material is still substantially molten, with said cutting being along a path which is substantially linear as compared to said convex surface and at a rate sufficiently high relative to the average extrusion velocity to produce a plurality of thin severed sections each section having a thickness substantially less than the width thereof, said severed sections being bounded by said convex surface and an edge extending in a plane subtending said convex surface,
c. permitting said cut sections to expand under said atmospheric pressure and to cool and form foam plastic bodies having substantially continuous outer integral skins and hollow, substantially hemispherical configurations.

3,961,001
METHODS OF MAKING FOAMED POLYMER TRIM PADS FOR VEHICLE SEATS

Eugene J. Bethe, Mishawaka, Ind., assignor to Uniroyal Inc., New York, N.Y.

Filed July 12, 1974, Ser. No. 487,909
Int. Cl.² B29D *27/04*
U.S. Cl. 264—46.4 **15 Claims**



1. A process of producing a cured polymer foam articles having a crowned top surface free of congealed polymer skin, comprising the steps of:

a. laying a backing fabric onto a previous supporting surface;

b. depositing uncured no-gel polymer latex foam onto said backing fabric to at least a selected minimum height and over an area at least equal in size to that of the article to be produced;

c. placing into the deposited mass of said latex foam an open-top open-bottom peripherally closed frame having a height not greater than said selected minimum height of said deposited mass of latex foam;

d. scraping all excess amounts of said latex foam protruding above the top of said frame off the latter so as to make the top surface of that portion of said latex foam remaining within the confines of said frame coplanar with the top surface of the latter;

e. subjecting said remaining portion of said latex foam at both the top and the bottom surfaces thereof to dry heat at elevated temperatures for rapidly dehydrating and curing said latex foam; and

f. removing said frame from the cured body of latex foam.

3,961,002
METHOD OF BUILDING CONSTRUCTION USING SYNTHETIC FOAM MATERIAL

Clarence Eugene Brown, 211 Watson Blvd., Centerville, Ga. 31093

Continuation of Ser. No. 90,988, Nov. 19, 1970, abandoned. This application Jan. 31, 1973, Ser. No. 328,379
Int. Cl.² B29D *7/04;* **E04B** *5/32, 1/16*
U.S. Cl. 264—46.5 **1 Claim**

1. A method of constructing a building, wherein the building is formed as an integral unit of synthetic material, comprising the steps of:

forming a mold unit according to a pre-determined design by positioning separate rigid, one-piece room units relative to one another so as to define a first set of cavities therebetween, said room units including tapered wall portions for facilitating easy removal of said building, and a first set of openings within said wall portions adjacent said cavities;

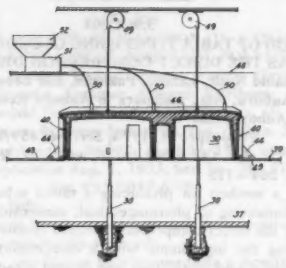
positioning door frame means within said first set of cavities adjacent said first set of openings within said wall portions, said door frame means including flange means which is provided with a series of openings;

positioning additional door frame means adjacent a second set of openings within exterior wall portions of said room units, said additional door frame means having flange means which is provided with a series of openings;

positioning window frame means adjacent a third set of openings within exterior wall portions of said room units, said window frame means having flange means which is provided with a series of openings;

positioning additional mold structures adjacent to said mold unit so as to form a second set of cavities between said structures and said unit, in which are disposed said additional door frame means and said window frame means;

filling said first and second set of cavities with a synthetic polyurethane foam building material such that said material respectively envelops said flange means, and respectively penetrates said openings within said flange means



of said door frame means, said additional door frame means, and said window frame means, whereby said door frame means, said additional door frame means, and said window frame means will be securely anchored within said synthetic material when said material sets;

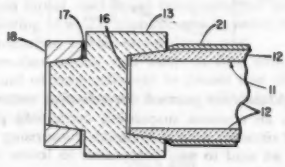
allowing said synthetic material to set; and

removing said mold unit and said mold structures from said set synthetic material so as to expose a building which includes interior wall portions and interior door openings formed within said first set of cavities, and exterior wall portions, exterior door openings, window openings, and a roof portion formed within said second set of cavities.

3,961,003
METHOD AND APPARATUS FOR MAKING ELONGATED SI AND SIC STRUCTURES

David L. Parsels, Carrollton, Ky., assignor to Dow Corning Corporation, Midland, Mich.

Continuation of Ser. No. 254,183, May 17, 1972, abandoned. This application Feb. 4, 1974, Ser. No. 439,165
Int. Cl.² B29C *13/00;* **B28B** *7/28*
U.S. Cl. 264—81 **8 Claims**



1. A method of making a one-piece elongated structure of vapor deposited silicon or silicon carbide, said structure having at least one flat side in the direction of elongation, which method comprises

Forming a graphite mandrel having an axis by forming mating surfaces on the edges of a plurality of elongated graphite elements having equal lengths and having end portions at each end thereof, said end portions being transverse to the edges having said mating surfaces, at

least one of said elements being a flat slab all of the elements having an external surface facing away from the axis of the mandrel; placing the elements in the configuration of the structure desired with said mating surfaces in mated relationship, and securing the mated elements in mated position by a pair of collars surrounding and in intimate contact with the end portions of said mated elements,

Heating of the graphite mandrel to the range of 1,000°–2,000°C.

Depositing said silicon or silicon carbide on said external surface of said heated mandrel from the vapor phase, and

Removing the mandrel from the deposited material.

3,961,004

METHOD OF TABLETTING USING GLUCONOLACTONE AS THE DIRECT COMPRESSION DILUENT

Syed Shahid Nasir, Lahore, Pakistan, and Leon Otto Wilken, Jr., Auburn, Ala., assignors to Auburn Research Foundation, Auburn, Ala.

Filed Apr. 11, 1974, Ser. No. 459,961

Int. Cl.² B29B *1/032;* **A61K** *31/365*

U.S. Cl. 264—115 **11 Claims**

1. In a method for producing a tablet selected from the group consisting of pharmaceutical, confectionary, and lozenge by the direct compression method consisting essentially of mixing the ingredients with a compression diluent and compressing said ingredients and diluent directly on a tablet press without any modification in the particle size after mixing wherein the improvement is using gluconolactone in an amount sufficient to act as the direct compression diluent by itself.

3,961,005

SPHERICAL AGGLOMERATION OF ILMENITE

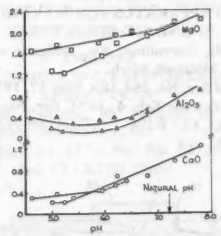
Bryan D. Sparks, Ottawa, Canada, assignor to Canadian Patents and Development Limited, Ottawa, Canada

Filed Aug. 28, 1972, Ser. No. 284,384

Claims priority, application Canada, Sept. 1, 1971, 121904

Int. Cl.² B01J *2/28*

U.S. Cl. 264—117 **13 Claims**



1. An agglomeration process for selective recovery of ilmenite from an aqueous suspension containing particulate ilmenite and siliceous gangue materials comprising

a. adding an acid to said suspension to lower the pH to about 4–5.5,

b. mixing in said suspension at least 10 lb/ton of said particulate materials of a hydrophobic organic collector containing polar groups which are selectively adsorbed by ilmenite, thereby rendering said particulate ilmenite hydrophobic,

c. adding a water-immiscible binder liquid to the mixture in an amount of about 100-200 lb/ton of said particulate materials,

d. agitating said mixture to cause said hydrophobic ilmenite solids to adsorb said binder liquid and thereafter form spherical ilmenite agglomerates, and

e. separating said ilmenite agglomerates from a residual aqueous suspension containing said siliceous materials.

3,961,006

PRODUCTION OF FLATS FOR CARDING MACHINES

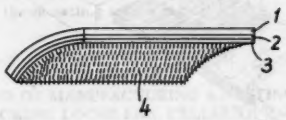
Curt Brandis, Bremen-St. Magnus, and Peter Müller, Bremen-Lesum, both of Germany, assignors to Fried. Krupp Gesellschaft mit beschrankter Haftung, Essen, Germany

Filed Nov. 12, 1974, Ser. No. 523,152

Claims priority, application Germany, Dec. 14, 1973, 2362206

Int. Cl.² B29C *17/08;* **B29D** *3/00, 31/00*

U.S. Cl. 264—138 **4 Claims**



1. A method for producing a flat for use in carding machines, the flat being composed of a rigid support body with a flexible covering fastened thereto, the covering having one side facing the body and the covering further having a plurality of card wires projecting from the covering at a side thereof directed away from the rigid body and distributed across the covering, said method comprising the steps of: disposing a flexible covering, having plural projecting wires, adjacent a convex cylindrical surface with the projecting wires directed toward the surface, the convex surface being shaped to define the desired contour of the card wire tips; pressing the flexible covering toward the cylindrical surface to cause the tip of each of the card wires to touch the cylindrical surface; disposing an associated rigid support body radially spaced from a surface of the covering which is directed away from the cylindrical surface; filling the space between the flexible covering and the rigid body with a hardenable plastic mass, causing said mass to harden and causing said mass to become firmly attached to said rigid body and to said covering, while the flexible covering is being pressed against the cylindrical surface; and then removing the resulting flat from the cylindrical surface.

3,961,007

CONTINUOUS PROCESS FOR MAKING FIBROUS CELLULOSE ACETATE FILTER MATERIAL

Arthur Caputi, Jr., and Thomas C. Wong, both of Modesto, Calif., assignors to E & J Gallo Winery, Modesto, Calif.

Filed Oct. 23, 1973, Ser. No. 408,296

Int. Cl.² D01D *5/26;* **D01F** *2/28*

U.S. Cl. 264—140 **11 Claims**

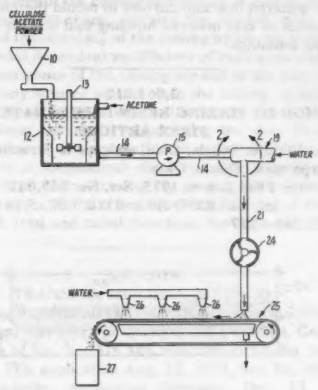
1. A continuous process for making fibrous cellulose acetate resembling asbestos in fibrous structure and filtering properties, comprising rod-shaped fibers intermingled with fluffy filaments and having a surface area of about 35 m^2/g to about 55 m^2/g comprising:

a. generating a solution of cellulose acetate in an organic solvent of intermediate polarity, the viscosity of said cellulose acetate being in the range of about 25 secs. to about 45 secs. and the concentration of said cellulose acetate in said solution being from about 2% to about 4% by weight;

b. simultaneously introducing into a precipitation zone a stream of said solution and a stream of a cellulose acetate precipitant in a manner yielding turbulence and head on collision of said streams in said zone, the volume ratio of said precipitant to said solution being in the range of about 4:1 to about 20:1;

c. continuously withdrawing the resulting slurry from said precipitation zone and passing said slurry through a shearing means whereby the precipitate portion of said

slurry is sheared to a surface area in the range of about 35 m^2/g to about 55 m^2/g;



d. continuously depositing the sheared slurry onto a porous support whereby the liquid portion of the slurry is drained from the precipitate portion thereof; and

e. washing said precipitate portion with a nonsolvent for cellulose acetate.

3,961,008

PROCESS FOR PREPARING POLYESTER SHAPED ARTICLES

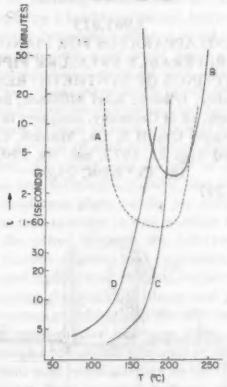
Takatoshi Kuratsuji; Shoji Kawase; Takeo Shima, all of Iwakuni; Sakae Shimotsuma, Atsugi, and Masahiro Hosoi, Sagamihara, all of Japan, assignors to Teijin Limited, Osaka, Japan

Filed Aug. 26, 1974, Ser. No. 500,503

Claims priority, application Japan, Aug. 29, 1973, 48-96229

Int. Cl.² B29C *25/00*; B29D *23/04*

U.S. Cl. 264—178 R **4 Claims**



2. A process for preparing a transparent sheet or film by melt-extruding a polyester containing tetramethylene naphthalene-2,6-dicarboxylate or hexamethylene naphthalene-2,6-dicarboxylate, comprising intimately contacting the extrudate with the surface of a casting drum kept at a temperature ranging from 75°C. to a point lower than the melting point of the polyester for 5 to 180 seconds immediately after extrusion to thereby solidify the extrudate without any substantial crystallization and thereafter quenching said solidified extrudate to produce a transparent polyester sheet or film wherein said intimate contacting and quenching steps are carried out prior to any stretching of said transparent sheet or film.

3. A process for preparing a transparent tube by melt-extruding a polyester containing tetramethylene naphthalene-2,6-dicarboxylate, comprising passing the extrudate through and in contact with a gaseous atmosphere kept at a temperature of 150° to 450°C. for 1 to 30 seconds immediately after extrusion to thereby solidify said extrudate without any substantial crystallization and thereafter quenching said solidified extrudate to produce a transparent polyester tube wherein said extrudate is passed through the gaseous atmosphere and quenched prior to any stretching of said transparent tube.

3,961,009

PROCESS FOR THE PRODUCTION OF A SHAPED ARTICLE OF A HEAT RESISTANT POLYMER

Naoya Yoda; Toshiya Yoshi-i; Saburo Fujita; Hiroshi Mochizuki; Hirosuke Yumoto; Masaru Kurihara; Takashi Kubota; Noriaki Dokoshi, and Chiaki Tanaka, all of Otsu, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Continuation of Ser. No. 30,952, April 22, 1970, abandoned. This application Aug. 1, 1973, Ser. No. 384,514

Int. Cl.² D01F *6/78*

U.S. Cl. 264—205 **7 Claims**

1. The process for the manufacture of heat resistant polymeric film comprising the steps of:

1. extruding into film at high temperature a flowable polymer composition containing solvent, which composition may be handled as a solid at room temperature, said composition being comprised of (a) a polymer having in the repeating units thereof, a member selected from the group consisting of precursor units which on heat curing form heterocyclic rings, and a mixture of said precursor units and heterocyclic rings formed from such precursor units, said polymer being selected from the group consisting of polyamide-imide, polyimide, and polyamide-acid and containing at least 15% of said heterocyclic rings by weight of said polymer and (b) 25–130% by weight of an organic solvent based on the weight of said polymer, said solvent being selected from the group cohsisting of N-methyl-2-pyrrolidone (NMP), N,N-dimethylacetamide (DMAC), N,N-dimethylformamide (DMF), N,N-dimethylmethoxy acetamide, N-methylcaprolactam, dimethyl sulfoxide, tetramethyl urea, pyridine, dimethylsulfone, hexamethylphosphoramide, tetramethylene sulfone, formamide, butyrolactam, N-acetylpyrrolidone, m-cresol and P-cresol, said polymer composition being normally solid at room temperature, said extrusion being carried out to form film at a temperature above room temperature and below the curing temperature of said polymer, immersing said extruded film in a liquid which is miscible with the solvent in said film, said polymer being insoluble in said liquid, said liquid being selected from the group consisting of water, aliphatic and aromatic hydrocarbons, hydrocarbon halides and ketones, and

2. thereafter curing said uncured film with an effective amount of heat sufficient to causes ring closure of said precursor units, hereby forming said heat resistant polymeric film.

3,961,010

METHOD OF MANUFACTURING HEAT EXCHANGERS

Robert Taylor Holmes, Cheltenham, England, assignor to Serck Industries Limited, Birmingham, England

Filed June 28, 1973, Ser. No. 374,322

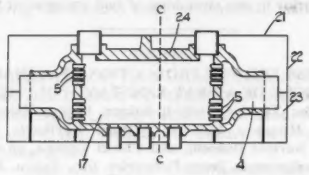
Claims priority, application United Kingdom, June 28, 1972, 30244/72

Int. Cl.² B29C *1/08*; B29D *31/00*

U.S. Cl. 264—221 **14 Claims**

1. A method of manufacturing a heat exchanger comprising the steps of: temporarily supporting a plurality of tubes by means including at least one removable, fugitive tube plate;

inserting at least a portion of the temporarily supported tubes into a first mould which defines the internal form of at least a portion of a shell and channel of a heat exchanger; feeding a flowable, solidifiable, fugitive material into the first mould so as to abut both sides of at least one fugitive tube plate and be moulded to said internal form; allowing said solidifiable material to solidify so that the tubes are held in position by said material, the material covering and filling spaces between the tubes; removing the tubes and solid material from the first mould; removing said at least one fugitive tube plate while leaving said solid material intact; inserting at least a portion of



the tubes and solid material into a second mould which defines the external form of a portion of a shell and at least one channel of the heat exchanger; feeding a settable material into the second mould so as to occupy space previously occupied by the fugitive tube plate and also be moulded to said external form in a cavity between the surfaces of said second mould and said fugitive material; allowing the settable material to set; removing the tubes; set material and solid, fugitive material from the second mould; and removing the solid, fugitive material from the set material to leave the tubes supported by the set material.

3,961,011

METHOD OF MAKING NETTING BY MOLDING PLASTIC ABOUT STRAND CROSSINGS

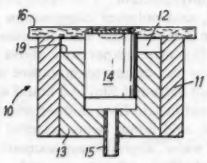
Anthony Bramley, Gosford House, Gosford, Kidlington Oxfordshire, England

Filed Apr. 9, 1974, Ser. No. 459,339

Claims priority, application United Kingdom, Apr. 13, 1973, 18006/73

Int. Cl.² B29C *5/00*; B29D *3/00*; B29F *1/00*

U.S. Cl. 264—251 **9 Claims**



1. A method of making netting comprising the steps of:
providing braided strands composed of synthetic thermoplastic fibres or filaments;
forming a plurality of such braided strands into an array of spaced, generally parallel longitudinal strands;
drawing further such braided strands transversely across said array of longitudinal strands at least singly to form strand crossings where respective transverse strands cross respective lontitudinal strands;
enclosing a plurality of said strand crossings in a corresponding plurality of die cavities;
mechanically compressing said strands together within said cavities sufficiently to laterally expand the strands at the strand crossing, by advancement of a pressure member into the die cavity and into compressively deforming relation with said crossing strands
releasing said mechanical compression by retracting said pressure member;
and, not earlier than said releasing, introducing thermoplastic material into said cavities to mould therein individual masses of said material bonding said strands together at said crossings.

3,961,012

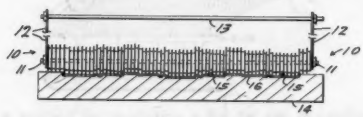
METHOD OF MAKING RESIN IMPREGNATED GLASS FIBER ARTICLE

Vincent DiMaio, Toledo, Ohio, assignor to Structural Plastics Incorporated, Toledo, Ohio

Filed Jan. 6, 1975, Ser. No. 539,022

Int. Cl.² B29D *3/02*; B32B *5/02*, *5/16*

U.S. Cl. 264—257 **2 Claims**



1. In a method of molding a glass fiber reinforced polyester article including applying a liquid polyester resin and chopped glass fibers to a glass fiber mat on a mold surface and rolling said resin and chopped fibers into the mat and curing said resin, the improvement comprising: performing said rolling step with a roller having plural side-by-side roller segments disposed on a common shaft, each said segment being adapted to allow individual radial displacement of each said segments under rolling conditions, each said segment including a flange portion and a leveling surface portion adjacent to said flange portion, said leveling surface portion having a lesser diameter than said flange portion, said flange portion having a peripheral outer surface, said improvement further comprising contacting said resin and said glass fiber mat with the peripheral surface of each said flange and separately leveling lateral increments of said resin with said leveling surfaces and further permitting each said roller segment to be displaced individually in a direction perpendicular to said mat during rolling.

3,961,013

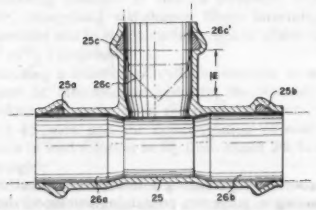
PROCESS AND APPARATUS FOR MANUFACTURING FITTINGS, PREFERABLY PRESSURE PIPE INSERTION FITTINGS OF SYNTHETIC RESIN

Johann Güthuber, Iribach; Karl Mühlner, and Peter Klenk, both of Munich, all of Germany, assignors to Kunststoffwerk Gerbruder Anger GmbH & Co., Munich, Germany

Filed Aug. 21, 1973, Ser. No. 390,206

Int. Cl.² B29C *25/00*

U.S. Cl. 264—297 **6 Claims**



1. In a process for molding stress-free thick-walled pressure pipe fittings of relatively large dimensions and where the wall thickness must be proportionally increased from a synthetic plastic material, the steps of movably positioning a core unit in a divided injection mold for a fitting having a branch por-

tion extending from a main portion and cores are placed in both portions, injecting a synthetic plastic molding material into the mold around the core to form a casting, cooling the wall outer zones of the casting sufficiently to enable the casting to maintain its shape, opening the divided mold at the beginning of the shrinking of the casting which sets in because of the material dependent co-efficient of expansion and while the wall inner zones of the casting are still in the plastic state but before any stresses are set up in the casting, maintaining the casting upon the core unit and removing the casting and core unit from the mold, withdrawing the core from said branch portion a distance sufficient to permit unrestricted shrinkage in a longitudinal direction with respect to the branch portion, thereafter rapidly cooling the casting, and then withdrawing all the cores after the shrinking of the castings in both axial and radial directions has been completed.

3,961,014

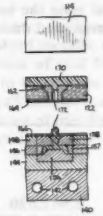
TRANSFER MOLDING METHOD

Lambert Pasch, Nutheim, and Heinz Wagemann, Aachen, both of Germany, assignors to Uniroyal A.G., Aachen, Germany

Division of Ser. No. 316,165, Dec. 18, 1972, Pat. No. 3,859,024. This application Aug. 21, 1974, Ser. No. 499,347
Claims priority, application Germany, Dec. 23, 1971, 2164219

Int. Cl.[2] B29G *3/00*

U.S. Cl. 264—297 **6 Claims**



1. A method of molding elastomeric stock, said method comprising interposing a multi-apertured, heat-resistant, flexible, insulation plate between a heated mold and an elastomeric stock injection unit, said mold having mold cavities aligned with corresponding ones of said apertures of said insulation plate, said elastomeric stock injection unit including a chamber in which pressure can be exerted against a quantity of elastomeric stock therein at least sufficient to fill said mold cavities, one side surface of said insulation plate confronting said injection unit, the other side surface of said insulation plate confronting and forming a parting line with said mold; deforming said insulation plate axially by moving said mold and said injection unit relative to one another such that each presses against the other through the intermediary of said insulation plate thereby causing said insulation plate to flexibly conform to, and tightly seal, varying surface irregularities of said mold pressing thereagainst along said parting line at each of said apertures; expelling and transferring a portion of said elastomeric stock under pressure from said chamber concurrently through each of said plurality of apertures in said insulation plate into said mold cavities to fill the latter under substantially uniform fluid pressure without seepage of said elastomeric between said mold and said injection unit at said parting line; and curing the transferred portion of elastomeric stock in said mold cavities, without separating said mold or said injection unit from said insulation plate or relaxing said fluid pressure, said insulation plate serving to thermally insulate the remaining portion of elastomeric stock in said chamber from said heated mold in order to prevent the curing of said remaining portion of stock with the curing of said transferred portion of stock.

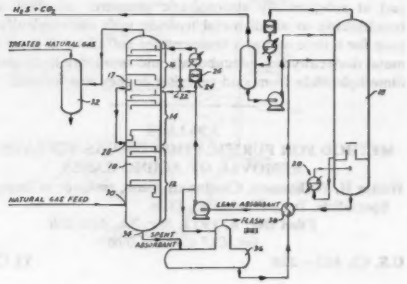
3,961,015

COMBINED HYDROLYSIS AND ABSORPTION PROCESS AND APPARATUS THEREFOR

Lawrence W. Dailey, Los Angeles, Calif., assignor to Societe Nationale des Petroles d'Aquitaine, Paris, France

Filed Aug. 21, 1969, Ser. No. 851,926
Int. Cl. B01d *53/34*

U.S. Cl. 423—229 **6 Claims**



1. A continuous process for treating natural gas streams containing hydrogen sulfide, carbon dioxide and carbonyl sulfide which comprises:

a. contacting the gas stream in a countercurrent flow with an aqueous ethanolamine solution as an absorbent for carbon dioxide and hydrogen sulfide in a first absorption zone at a net temperature at which the capacity of the absorbent for hydrogen sulfide and carbon dioxide per unit volume is high;

b. passing the gas stream from said first absorption zone to a second absorption-reaction zone where it is brought in countercurrent contact with an aqueous ethanolamine solution maintained at a temperature at which carbonyl sulfide will hydrolyze in the presence of water to hydrogen sulfide and carbon dioxide;

c. passing said gas stream through a third absorption zone where it is brought into countercurrent contact with a cooled, lean aqueous ethanolamine solution for absorption of formed hydrogen sulfide and carbon dioxide and any carbon dioxide and hydrogen sulfide not absorbed in said first zone and second absorption-reaction zone; and

d. combining the aqueous solution from said third absorption zone with the aqueous solution from said second absorption-reaction zone and passing said combined streams to said first absorption zone.

3,961,016

METHOD OF REMOVING CARBON MONOXIDE FROM GASES

Bernard C. Gerstein, Ames, Iowa, and David B. Macaulay, Arlington Heights, Ill., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Apr. 26, 1974, Ser. No. 464,428
Int. Cl.[2] B01D *53/34*

U.S. Cl. 423—247 **4 Claims**

1. A method of purifying an atmosphere, containing oxygen, of carbon monoxide which may be contained therein comprising: passing the atmosphere through a bed of a catalyst of terbium oxide heated to activation temperature, whereby the carbon monoxide is oxidized to carbon dioxide thereby purifying the atmosphere of carbon monoxide.

3,961,017
PRODUCTION OF DODECAHYDRODODECABORATE (2-)

William Vernon Hough, Evans City; Clarence Robert Guibert, Mars, and Gerald Thomas Hefferan, Butler, all of Pa., assignors to Mine Safety Appliances Company, Pittsburgh, Pa.

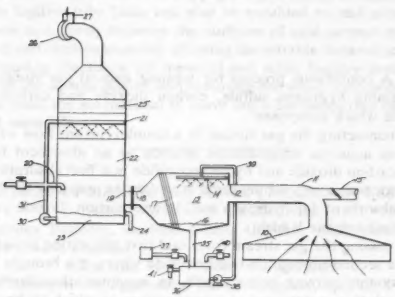
Filed Mar. 24, 1975, Ser. No. 561,283
Int. Cl.² C01B 35/18
U.S. Cl. 423—286 10 Claims

1. A process for preparing an alkali metal dodecahydrododecaborate which comprises reacting at a temperature between about 90°C and about 200°C, in an inert atmosphere and at substantially atmospheric pressure, an alkali metal borohydride or alkali metal hydride with dimethylsulfideborane for a time and at a temperature sufficient to form alkali metal dodecahydrododecaborate and removing hydrogen and dimethylsulfide from said reaction as they are formed.

3,961,018
METHOD FOR PURIFICATION OF GAS STREAMS BY REMOVAL OF ACIDIC GASES

Walter H. Williamson, Cincinnati, Ohio, assignor to United Air Specialists, Inc., Cincinnati, Ohio

Filed Dec. 6, 1973, Ser. No. 422,210
Int. Cl.² C01B 17/16
U.S. Cl. 423—228 11 Claims



9. A continuous process for purifying a moving gas stream by removal of acidic gases therefrom chosen from the group consisting of nitrogen oxides, carbon dioxide, hydrogen sulfide, sulfur dioxide, halogen gases, formic acid gases, acetic acid gases, and mixtures thereof, which comprises passing said gas stream into a reaction zone, continuously admitting a vapor of an amine chosen from the group consisting of water-soluble primary, secondary, and tertiary aliphatic and aralkyl amines, and mixtures thereof, into said zone in an amount sufficient to produce a partial vapor pressure of said amine of at least 5 percent of the total pressure within said reaction zone, commingling said gas stream and said amine vapor whereby to effect a vapor phase reaction of said amine vapor with said acidic gases, separating the reaction products of said amine vapor and acidic gases from said gas stream and discharging the so-purified gas stream to atmosphere.

3,961,019
METHOD FOR PURIFICATION OF EXHAUST GASES

Shinobu Satoh, No. 1-51, Hizumi 1-chome, Kashiwazaki, Niigata, Japan

Filed Mar. 21, 1974, Ser. No. 453,192
Claims priority, application Japan, Mar. 30, 1973, 48-36992
Int. Cl.² C01B 21/00
U.S. Cl. 423—235 3 Claims

1. A method for the purification of hot exhaust gas which contains as impurities NO_x, SO_2, CO_2 and CO from a combustion operation, which comprises the steps of: in a first purification stage, flowing the exhaust gas in an overall horizontal direction through one or a plurality of sinuous conduits arranged in a substantially vertical plane with the conduit or conduits having upper reversely curved bends connected by intermediate upright sections to lower reversely curved bends, injecting an aqueous solution of alkaline material having a pH of 7.5-12 into the flowing exhaust gas stream at a plurality of locations inside the upright sections of said conduit with said aqueous alkaline solution being directed longitudinally in the conduit in the same direction as the direction of flow of the exhaust gas so as to precipitate the reaction products of said alkaline material with said impurities in said exhaust gas, and removing said aqueous alkaline solution and precipitates contained therein from the lower bends of the conduit or conduits; and then, in a second purification stage, flowing the exhaust gas that exits from the first purification stage horizontally through a zone containing a plurality of upright, horizontally spaced-apart, glass fiber mats so that the exhaust gas passes in series through the glass fiber mats, and simultaneously injecting into the zone, at locations between the glass fiber mats, streams of an aqueous solution of oxygen-generating material effective to generate oxygen by thermal decomposition in said zone by contact with said hot exhaust gas, said streams of said aqueous solution of oxygen-generating material being injected horizontally toward the mats and in the same direction as the direction of flow of the exhaust gas whereby an additional quantity of the remaining impurities in said exhaust gas adhere to or are adsorbed by the glass fiber mats and oxygen is generated in the exhaust gas, and removing from the bottom of said zone the spent aqueous solution of oxygen-generating material; and then discharging the exhaust gas leaving said zone.

3,961,020
PROCESS FOR REMOVING SULFUR OXIDES AND NITROGEN OXIDES FROM FLUE GASES USING HALOGEN-IMPREGNATED ACTUATED CARBON WITH SIMULTANEOUS INJECTION OF AMMONIA

Michiharu Seki, Fuchu, Japan, assignor to Hitachi, Ltd., Japan

Filed Oct. 5, 1973, Ser. No. 403,832
Claims priority, application Japan, Oct. 9, 1972, 47-100685; Oct. 23, 1972, 47-105301; Nov. 13, 1972, 47-113005
Int. Cl.² B01J 8/00; C01B 21/00; B01D 53/34
U.S. Cl. 423—239 28 Claims

1. A process for removing at least one nitrogen oxide or sulfur oxide from a flue gas comprising contacting the flue gas in the presence of oxygen with a bed of carbonaceous material selected from the group consisting of activated carbon, graphite, carbonized char and amorphous carbon, said carbonaceous material being impregnated with a halogen or halogen compound selected from the group consisting of iodine, bromine, chlorine, ammonium iodide, ammonium bromide, ammonium chloride, hydrogen iodide, hydrogen bromide and hydrogen chloride, said bed containing at least 0.01 gram of said halogen or at least 0.01 gram of said halogen compound measured in terms of the halogen content of said halogen compound per kilogram of said carbonaceous material, said flue gas being contacted with said bed at a temperature at which the ammonium salt of said halogen or the ammonium salt of the halogen component of said halogen compound can be adsorbed by said carbonaceous material, and simultaneously feeding to said bed ammonia or a compound capable of liberating ammonia at the temperature at which the flue gas contacts said bed so that ammonia contacts said carbonaceous material as said flue gas contacts said carbonaceous material, thereby removing said at least one nitrogen oxide or sulfur oxide from said flue gas.

3,961,021
METHOD FOR REMOVING SULFUR DIOXIDE FROM COMBUSTION EXHAUST GAS

Tomijiro Morita; Akio Kobayashi; Isao Funahashi; Toshiharu Matsuda; Makoto Naoki, all of Iwaki; Naoyuki Kawamata, Kobe, and Jun Fukui, Tokyo, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sept. 17, 1974, Ser. No. 506,721

Claims priority, application Japan, Sept. 25, 1973, 48-107807; Jan. 8, 1974, 49-5431

Int. Cl.² C01F *11/46;* **B01D** *53/34*

U.S. Cl. 423—242 **18 Claims**

1. A method for removing sulfur dioxide from combustion exhaust gas and converting the sulfur dioxide to gypsum, said process comprising:

contacting the sulfur dioxide containing combustion exhaust gas with an aqueous solution containing an alkali sulfite to absorb the SO_2 as bisulfite;

reacting said alkali bisulfite in solution with a calcium compound containing metallic impurities to form a mixture of calcium sulfite, metallic sulfite impurities, and an aqueous solution containing alkali sulfite;

separating at least a portion of the alkali sulfite solution from said mixture and returning said portion to the sulfur dioxide contacting step, thereby forming a sulfite circulation loop;

forming an aqueous slurry of said calcium sulfite and metallic sulfites;

oxidizing said slurry to form gypsum and an aqueous solution containing the metallic impurities dissolved in the form of sulfates;

separating said gypsum from solution to leave a first effluent containing the dissolved metallic sulfate impurities;

mixing at least a portion of said first effluent with alkali sulfite for reaction to form a precipitate of metallic sulfites and soluble alkali sulfate; and

separating said precipitate of metallic sulfites from solution and returning the remaining solution to the sulfite circulation loop.

3,961,022
SILICATE DISSOLVING

Richard H. Pierce, Broomall, Pa., assignor to Philadelphia Quartz Company, Valley Forge, Pa.

Division of Ser. No. 415,899, Nov. 14, 1973, Pat. No. 3,898,318. This application Dec. 12, 1974, Ser. No. 533,440

Int. Cl.² B01D *11/02;* **C01B** *33/32*

U.S. Cl. 423—332 **4 Claims**

1. In the known process of dissolving alkali metal silicate glass in water at elevated temperatures to form alkali metal silicate solutions, the improvement allowing the formation of homogeneous and sparkling clear alkali metal silicate solutions and comprising:

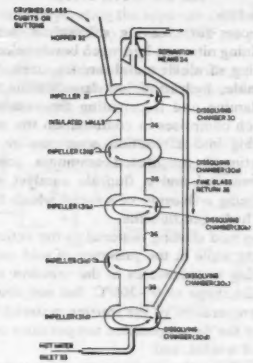
a. contacting particles of said alkali metal silicate glass with water and alkali metal silicate solution at temperatures between 80°C and the boiling point of the solution formed and at atmospheric pressure in a vertical stack of connected dissolving chambers each having an impeller of independent speed and pitch;

b. introducing hot water into the bottom chamber of said vertical stack so that the flow of liquid and entrained particles of silicate glass finer than 325 mesh is upward through said vertical stack of chambers;

c. operating said impellers of each successively lower chamber at an increased speed;

d. introducing said particles of alkali metal silicate to the uppermost chamber so that the flow of alkali metal silicate particles larger than 325 mesh is downward through the vertically stacked chambers;

e. discharging alkali metal silicate solution from the uppermost chamber to a centrifuge; and



f. returning the fine particles from the centrifuge to the bottom chamber of said vertical stack.

3,961,023
PROCESS FOR THE PRODUCTION OF CYANOGEN CHLORIDE AND HYDROGEN CHLORIDE

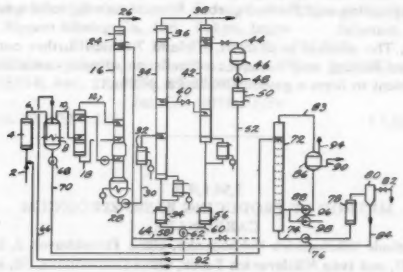
Friedhelm Geiger; Werner Heimberger; Gerd Schreyer, all of Hanau, and Wolfgang Weigert, Offenbach, all of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Germany

Filed Jan. 13, 1975, Ser. No. 540,706

Claims priority, application Germany, Jan. 12, 1974, 2401412

Int. Cl.² C01B *21/18*

U.S. Cl. 423—383 **18 Claims**



1. In a process for producing cyanogen chloride and hydrogen chloride by reacting hydrogen cyanide and chlorine, separating from the gaseous mixture (1) hydrogen chloride and (2) either cyanogen chloride or a mixture of cyanogen chloride and chlorine by absorbing (2) in a halohydrocarbon solvent which has a boiling point between that of cyanogen chloride and cyanuric chloride, separating the dissolved (2) from the solvent by distillation of (2) in a column and returning the solvent to the absorption apparatus the improvement comprising employing as the solvent for the absorption a trifluoromethyl aromatic hydrocarbon or trifluoromethyl haloaromatic hydrocarbon.

3,961,024

FLUORO COMPOUND PRODUCTION

Richard K. Vitek, Florham Park, N.J., assignor to Allied Chemical Corporation, New York, N.Y.

Filed June 18, 1963, Ser. No. 289,778
Int. Cl.[2] C01B *21/52*
U.S. Cl. 423—406 14 Claims

1. The process for cleaving substituted ammonia compounds containing nitrogen-hydrogen bonds selected from the group consisting of alkali metal amides, urea, biuret, sulfamide, formamide, hydrazine, ethylenediamine, cyanoguanidine and melamine and fluorinating the resulting cleavage products, which comprises in combination the steps of:

a. introducing into a reaction zone one or more of the aforementioned substituted ammonia compounds as starting material and a fluoride catalyst, said fluoride catalyst being a fluoride of a metal which forms an acid salt with hydrogen fluoride,

b. subjecting said starting material to the action of elemental fluorine while in the presence of said catalyst,

c. maintaining temperatures in the reaction zone substantially in the range of 0°–300°C. but not above the phase change temperature of the starting material if a liquid, or not above the decomposition temperature of the starting material if a solid, and

d. collecting from the reaction zone the volatile off-gases containing fluorinated cleavage products.

3,961,025

METHOD OF CARBONIZING A SUBSTANCE COMPRISING CELLULOSE

Alfred J. Harendza-Harinxma, 50 Merion Place, Lawrenceville, N.J. 08648

Filed Dec. 19, 1974, Ser. No. 534,642
Int. Cl.[2] C01B *31/00*
U.S. Cl. 423—415 R 12 Claims

7. A method for treating solid waste material containing cellulose which comprises:

treating the solid waste material with an aqueous solution comprising a dissolved alkali metal meta aluminate;

heating said treated solid waste material to carbonize the material comprising cellulose to form carbon; and

separating said formed carbon from remaining solid waste material.

8. The method as defined in claim 7 which further comprises heating said formed carbon in an oxygen containing ambient to form a gaseous oxidation product.

3,961,026

METHOD OF PRODUCING BASIC ZIRCONIUM CARBONATE

Vladimir Nikiforovich Pokhodenko, ulitsa Tereshkovoi, 2, kv. 37, and Ivan Nikiforovich Tselik, ulitsa Ostrovidova, 30, kv. 4, both of Odessa, U.S.S.R.

Continuation of Ser. No. 295,267, Oct. 5, 1972, abandoned, which is a continuation of Ser. No. 71,342, Sept. 11, 1970, abandoned. This application Aug. 12, 1974, Ser. No. 497,149
Int. Cl.[2] C01G *25/00*
U.S. Cl. 423—419 6 Claims

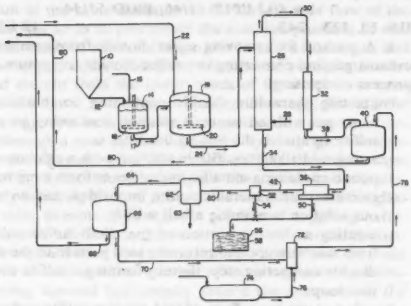
1. A method of producing crystalline basic zirconium carbonate which approximately corresponds to the formula $4ZrO_2.CO_2.11H_2O$ comprising reacting basic zirconium sulfate with a carbonate selected from the group consisting of ammonium carbonate and an alkali carbonate in an aqueous medium at room temperature and pressure wherein the quantity of said reacting carbonate is 0.8 mole per mole of ZrO_2 contained in the basic zirconium sulfate.

3,961,027

CYCLIC PROCESS FOR RE-USE OF WASTE WATER GENERATED DURING THE PRODUCTION OF UO_2

Thomas J. Crossley, Chapin, S.C., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 18, 1973, Ser. No. 407,722
Int. Cl.[2] C01G *43/02;* C02B *1/46*
U.S. Cl. 423—6 7 Claims



2. In the process of producing ammonium diuranate (ADU) from an aqueous solution containing UF_6 dissolved therein and wherein an excess of ammonium hydroxide is admixed with the aqueous solution of UF_6 to precipitate ADU which is thereafter separated from the aqueous solution leaving a large volume of waste water containing NH_4F, NH_4OH and small amounts of uranium, the improvement of steps comprising adding a slight stoichiometric excess of an alkaline earth metal compound which is capable of reacting to form alkali earth metal fluoride precipitate of low solubility in the treated waste water, distilling the aqueous waste water to volatilize the ammonium hydroxide therefrom and condensing the distillate for reuse in treating more aqueous UF_6 solutions, separating the alkali earth metal fluoride precipitate from the waste water in one or more steps, contacting the aqueous residue with an cationic ion exchange resin to remove the alkali earth metal and other cationic metal impurities from the added alkaline earth compound therefrom, and recirculating the so treated water, said treated water being suitable for recycle, including dissolving more UF_6 and producing more ammonium hydroxide solution.

3,961,028

METHOD OF PRODUCING CUPROUS SULFATE AND BISULFATE SOLUTIONS

Alan James Parker; Winfield Earle Waghorne, both of Canberra; Dion Ewing Giles; John Howard Sharp, both of Sydney; Robert Alexander, and David Michael Muir, both of Canberra, all of Australia, assignors to Anumin Pty. Limited, Canberra, Australia

Division of Ser. No. 237,061, March 22, 1972, Pat. No. 3,865,744. This application Dec. 17, 1974, Ser. No. 533,725
Claims priority, application Australia, Apr. 2, 1971, 4500/71; Apr. 2, 1971, 4501/71; Apr. 2, 1971, 4502/71; Apr. 28, 1971, 4735/71; June 4, 1971, 5/10/71; Sept. 14, 1971, 6281/71; Sept. 24, 1971, 6411/71; Jan. 26, 1972, 7776/72; Oct. 20, 1971, 6718/71; Oct. 26, 1971, 6798/71; Dec. 14, 1971, 7383/71
Int. Cl.[2] C01G *3/10;* C22B *15/00, 15/08*
U.S. Cl. 423—41 5 Claims

1. A method of preparing a solution containing cuprous sulfate, cuprous bisulfate or mixtures thereof which comprises mixing a homogeneous solution containing at least 15% by volume water, at least 0.1% by weight cupric ion as cupric sulfate, at least 0.5% by volume sulfuric acid and at least 4% by volume of an organic nitrile selected from the group con-

sisting of acetonitrile, acrylonitrile and 2-hydroxycyanoethane with particulate solids containing metallic copper and substances insoluble in the said homogeneous composition at a temperature within the range of 10°C to 75°C, allowing said copper and said solution to react and thus to form a solution containing cuprous sulfate, cuprous bisulfate or mixtures thereof and separating the solution from the unreacted substances.

3. A method of leaching copper as a solution containing cuprous sulfate, cuprous bisulfate or mixtures thereof from a substance selected from the group consisting of copper sulfides and materials containing copper and sulfide ions, comprising mixing said substance in particulate form at 10°C to 75°C with a homogeneous solution containing at least 0.5% by volume sulfuric acid, at least 15% by volume water, at least 0.5% by weight cupric ion as cupric sulfate and at least 20% by volume of an organic nitrile selected from the group consisting of acetonitrile, acrylonitrile and 2-hydroxycyanoethane until a solution containing cuprous sulfate, cuprous bisulfate or mixtures thereof is produced, and then separating said solution from any residual solids.

3,961,029
PROCESS FOR RECOVERING CHROMIC ACID SOLUTION FROM A WASTE LIQUOR CONTAINING CHROMIC IONS

Yoshio Senoo, Tokyo, Japan, assignor to Tokico Ltd., Tokyo, Japan

Filed May 6, 1974, Ser. No. 467,612

Claims priority, application Japan, May 21, 1973, 48-56549; Dec. 20, 1973, 48-143322

Int. Cl.² C01G 37/12

U.S. Cl. 423—54 **7 Claims**

1. A process for recovering chromic acid solution from an aqueous waste liquor containing chromate ions, comprising:

a. adding to said waste liquor a reducing agent capable of reducing chromate ions to chromium (III) ions at an acidic pH;

b. reducing said chromate ions in said waste liquor at an acidic pH until substantially all of said chromate ions are converted to chromium (III) ions;

c. adding an alkaline reagent providing hydroxyl ions to the liquor containing said chromium (III) ions to make the pH of said liquor alkaline and to precipitate said chromium (III) ions as chromium (III) hydroxide;

d. separating the precipitated chromium (III) hydroxide from the supernatant liquor which is substantially free of chromium ions;

e. adding an alkali and aqueous hydrogen peroxide to the precipitated chromium (III) hydroxide in an amount sufficient to convert substantially all of said precipitate to a chromate ion-containing aqueous solution; and

f. passing the resulting aqueous solution containing said chromate ions through an H form acidic cation-exchange resin to produce a chromic acid solution.

3,961,030
PRODUCTION OF ALUMINA FROM ORES

Tadeusz K. Wiewiorowski, New Orleans, and David J. Miller, Gretna, both of La., assignors to Freeport Minerals Company, New York, N.Y.

Filed Aug. 12, 1974, Ser. No. 496,577

Int. Cl.² C01F 7/22

U.S. Cl. 423—126 **8 Claims**

1. A process which comprises:

a. reacting an aluminum-containing ore with hydrofluoric acid, fluosilicic acid or a mixture of hydrofluoric and fluosilicic acid, at a 0 to about 10% stoichiometric excess of acid and at a temperature of about 122° to about 212°F, to form a slurry containing aluminum fluoride in its liquid phase;

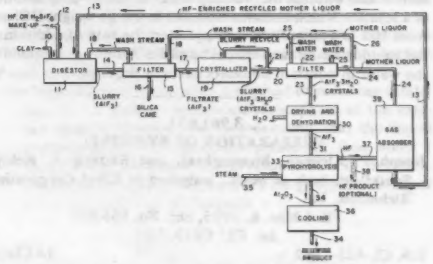
b. separating the liquid phase containing the aluminum fluoride from the solid phase of the slurry;

c. subjecting the separated liquid phase to crystallization to produce crystals of hydrated aluminum fluoride;

d. separating the crystals from the crystallization mother liquor;

e. drying and dehydrating the separate crystals, at a temperature of about 200°F to about 1400°F, to produce aluminum fluoride;

f. pyrohydrolyzing the aluminum fluoride, at a temperature of about 1500°F to about 2500°F, to produce alumina and hydrofluoric acid;



g. absorbing the hydrofluoric acid produced in step (f) in a first portion of the separated crystallization mother liquor, and recycling the fluorine enriched mother liquor to step (a) of the process;

h. washing the separated crystals produced in step (d) and the separated solid phase of the slurry produced in step (b) with water, and recycling the water to step (a) of the process; and

i. washing the separated solid phase of the slurry produced in step (b) with a second portion of the separated crystallization mother liquor, and recycling the mother liquor to step (a) of the process.

3,961,031
METHOD FOR REMOVAL OF MERCURY IN SULFUR DIOXIDE-CONTAINING GAS

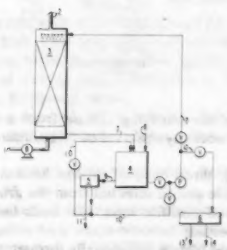
Hiroshi Yasui, Tanashi; Iwao Kyono, Urawa; Hideo Aoki, Ageo, and Haruo Manabe, Isuruga, all of Japan, assignors to Nippon Mining Co., Ltd., Tokyo, Japan

Filed Nov. 11, 1974, Ser. No. 522,832

Claims priority, application Japan, Nov. 9, 1973, 48-125514; Apr. 17, 1974, 49-42200

Int. Cl.² B01D 53/34

U.S. Cl. 423—210 **7 Claims**



1. A method for the removal of mercury vapor contained in a sulfur dioxide-containing gas containing at least 0.1% by volume sulfur dioxide which comprises contacting the sulfur dioxide-containing gas with an aqueous thiourea solution having a pH below 0.5.

3,961,032

METHOD FOR CLEANING GASES AND VAPORS

Jacobus Cornelis Vermeulen, Arnhem, and Eric Jan Stuart, Heemskerk, both of Netherlands, assignors to Hoogovens Ijmuiden, B.V., Ijmuiden, Netherlands

Filed Dec. 11, 1974, Ser. No. 531,560

Claims priority, application Netherlands, Dec. 11, 1973, 7316907

Int. Cl.² B01D *53/34*

U.S. Cl. 423—210 5 Claims

1. Method of continuous treatment of CaO-carrying gas or vapour produced in steel-making by washing the gas or vapour with water, wherein the washing water is acidified by addition of a solution which contains from 0.5 to 2% by weight HCl and from 100 to 150 g. Fe^{++} ions per liter, the rate of addition of the solution being such that H^+ and Fe^{++} ions are supplied to the water in constant amounts per unit time.

3,961,033

PREPARATION OF BROMINE

Joseph P. Kleiman, Birmingham, and Kestutis A. Keblys, Southfield, both of Mich., assignors to Ethyl Corporation, Richmond, Va.

Filed Mar. 6, 1975, Ser. No. 555,801

Int. Cl.² C01B *7/00*

U.S. Cl. 423—502 14 Claims

1. Process for preparing bromine comprising reacting chlorine with ethylene dibromide in the presence of a catalytic quantity of aluminum halide selected from aluminum chloride, aluminum bromide, and aluminum chlorobromides.

3,961,034

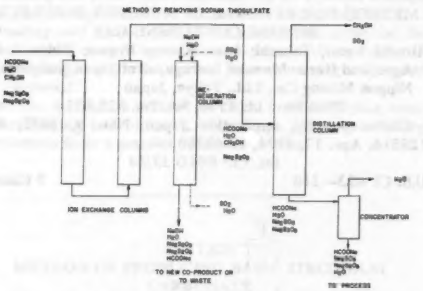
METHOD OF REMOVING SODIUM THIOSULFATE FROM A HYDROSULFITE REACTION MIXTURE

Logan C. Bostian, Virginia Beach, and Charles E. Winslow, Norfolk, both of Va., assignors to Virginia Chemicals Inc., Portsmouth, Va.

Filed Sept. 25, 1974, Ser. No. 509,160

Int. Cl.² C01B *17/64*

U.S. Cl. 423—181 4 Claims



1. A method for purifying filtrate from a formate-sodium hydrosulfite process by removal of thiosulfate ions therefrom, comprising:

A. providing three beds of an ion exchange resin having exchangable anions selected from the group consisting of formate and bisulfite ions, said beds being sequentially interconnected;

B. passing said filtrate sequentially through two of said beds;

C. feeding effluent from a second of said two beds to a distillation column and removing methanol therefrom as overhead;

D. feeding bottoms from said distillation column to a concentrator and removing excess water therefrom; and

E. when thiosulfate in effluent from the first of said two beds is found by analysis to be substantially equal to said thiosulfate in said filtrate, regenerating said first of said two beds by feeding a dilute solution of sodium hydroxide therethrough while passing said filtrate sequentially through the second and third of said three beds.

3,961,035

PROCESS FOR PREPARING HYDROGEN SULFIDE

Harold S. Mickley, Westport, Conn., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Mar. 27, 1974, Ser. No. 455,462

Int. Cl.² C01B *17/16*

U.S. Cl. 423—563 10 Claims

1. A process for preparing hydrogen sulfide which comprises:

a. providing a gas mixture containing carbon monoxide;

b. heating said gas mixture to a temperature above about 500°F. by direct heat exchange with a heated material whereby the heated material is cooled in a first zone;

c. introducing sulfur into the gas mixture and reacting the gas mixture with the sulfur at a temperature between about 500° and 1300°F. to form a gas mixture containing carbonyl sulfide in a second zone;

d. reacting the gas mixture containing carbonyl sulfide with water, in the vapor phase, at a temperature between about 400°F. and about 1300°F. to form a reacted gas mixture containing hydrogen sulfide in a third zone; and

e. cooling said reacted gas mixture by direct heat exchange with a cooled material whereby said cooled material is heated to be used as the heated material in said first zone.

3,961,036

ALUMINA SYNTHESIS

Glen P. Hamner, and William J. Mattox, both of Baton Rouge, La., assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed Jan. 4, 1974, Ser. No. 430,776

Int. Cl.² C01F *7/02*

U.S. Cl. 423—628 5 Claims

1. A method for preparing an alumina having a surface area ranging from about 375 to 580 m^2/gm (BET) which comprises reacting ethylene oxide with aluminum chloride, aluminum hydroxychloride or mixtures thereof to obtain a raw alumina product comprised of alumina monohydrate, alumina trihydrate or mixtures thereof, and heating said raw alumina, prior to calcination at temperatures in excess of 450°F, from 500°F to at least 800°F in the presence of excess elemental halogen.

3,961,037

PROCESS FOR FORMING HYDROGEN AND CARBON DIOXIDE USING A CATALYST CONSISTING ESSENTIALLY OF OXIDES OF COPPER, ZINC AND ALUMINUM OR MAGNESIUM

Phineas Davies, and Alan James Hall, both of Norton-on-Tees, England, assignors to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 483, Jan. 2, 1970, abandoned, which is a continuation of Ser. No. 513,112, Dec. 10, 1965, abandoned. This application Nov. 27, 1973, Ser. No. 419,298

Claims priority, application United Kingdom, Jan. 5, 1965, 482/65

Int. Cl.² C01B *1/02, 1/08, 2/06, 3/20*

U.S. Cl. 423—656 5 Claims

1. In a process wherein carbon monoxide and steam are reacted by contacting the same with a catalyst at a temperature below 300°C to form hydrogen and carbon dioxide, the improvement which comprises carrying out said reaction with a catalyst consisting essentially of the reduced co-precipitated oxides of copper, zinc and at least one metal selected from the group consisting of aluminum and magnesium, said co-precipitated oxides being obtained by reacting a mixture of non-halides, sulphur-free, water-soluble salts of copper, zinc and the other metal in aqueous solution with a compound of

the group consisting of ammonium carbonate, ammonium bicarbonate, an alkali metal carbonate and an alkali metal bicarbonate whereby the copper, zinc and other metal are co-precipitated after which the resulting co-precipitate is washed substantially free of soluble salts, dried and calcined; said catalyst containing, on the basis of the total number of metal atoms present, from 10 – 70% copper, 4 – 20% other metal, balance essentially zinc in an amount of at least 20%, and the amount of oxide of said other metal being such that the activity of the catalyst is stabilized so that said activity is maintained at an increased level for a longer period of time than for a similar catalyst without said oxide of other metal.

3,961,038
PROCESS FOR THE MANUFACTURE OF INJECTABLE PREPARATIONS OF TC99M AND/OR IN113M AND APPARATUS FOR CARRYING OUT THE PROCESS

Ivan Benes, Greifensee, Switzerland, assignor to Solco Basel AG, Basel, Switzerland

Filed May 7, 1973, Ser. No. 357,701

Claims priority, application Switzerland, May 8, 1972, 6881/72; Feb. 8, 1973, 1810/73

Int. Cl.² A61K *43/00*

U.S. Cl. 424—1 **14 Claims**

1. Process for preparing an injectable preparation of a radionuclide selected from the group consisting of technetium-99m and indium-113m of high specific activity per volume, which comprises contacting an aqueous solution of the radionuclide of low specific activity per volume with a sparingly water-soluble metal hydroxide precipitate, separating the metal hydroxide precipitate, with the radionuclide concentrated therein, from the aqueous solution, and dissolving said metal hydroxide precipitate in an aqueous solution containing a dissolved compound capable of forming a stable and physiologically acceptable chelate with the metal ions of the metal hydroxide to form a chelate of the metal.

3,961,039
URINARY SEDIMENT STAIN

Richard Sternheimer, 1765 East 55th St., Chicago, Ill. 60615

Continuation-in-part of Ser. No. 410,917, Oct. 29, 1973, abandoned. This application Apr. 24, 1975, Ser. No. 571,067

Int. Cl.² G01N *1/30, 33/16*

U.S. Cl. 424—3 **5 Claims**

1. A stain for unfixed, wet urinary sediment and cellular elements of serous effusions comprising an aqueous solution having a ph of from about 2 to about 5 including in combination a copper phthalocyanin dye, and a red xanthene dye, wherein the ratio by weight of the copper phthalocyanin dye to the red xanthene dye is in the range of from about 5 to 1 to about 1 to 5, whereby the copper phthalocyanin dye stains the nucleus of damaged cells present in the sediment or serous effusions a blue color and the red xanthene dye stains the cytoplasm of the cells present in the sediment or serous effusions a red color and the mucoproteins present in the sediment or serous effusions are distinctly stained blue to permit differentiation between cellular nuclear material and cellular cytoplasmic material and mucoprotein material.

3,961,040
INSECTICIDAL EVAPORATOR HAVING A DIFFUSION LAYER OF OLEFIN POLYMERIZATE

Bernard Rabussier, Aventon, and Jean-Pierre Mandon, Poitiers, both of France, assignors to Airwick Industries, Inc., Carlstadt, N.J.

Filed Mar. 13, 1974, Ser. No. 450,935

Claims priority, application Luxemburg, Mar. 16, 1973, 67231

Int. Cl.² A01N *17/00, 9/36*

U.S. Cl. 424—33 **8 Claims**

1. In an insecticidal evaporator comprising

I an absorbent fibrous mass substrate impregnated with a liquid composition comprising

a. from about 40 to 90% by weight of the total liquid composition of 2,2-dichlorovinyldimethylphosphate

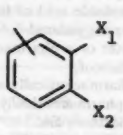
b. an epoxidised organic liquid compound having a maximum vapor pressure no greater than the vapor pressure of 2,2-dichlorovinyldimethylphosphate; and

c. an organic compound which is miscible with or soluble in the mixture of 2,2-dichlorovinyldimethylphosphate and said epoxidised organic compound; and

II a non-porous, olefin polymer diffusion layer covering at least part of said impregnated fibrous mass, the remaining surface of said fibrous mass being covered by an envelope impermeable to said liquid composition;

said epoxidised organic compound promoting the exudation of 2,2-dichlorovinyldimethylphosphate at the exterior surface of said diffusion layer,

the improvement comprising a method of reducing exudation of 2,2-dichlorovinyldimethylphosphate at the exterior surface position, by incorporating into the liquid composition as the organic compound (c), from about 1 to about 40% by weight of said composition, of an exudation-reducing agent selected from the group consisting of (1) a compound of the formula



in which

X_1 represents hydrogen,

X_2 represents hydrogen or one of the substituents defined for $(R)_n$, or

X_1 and X_2 jointly represent a divalent bridge of the formula

—CH=CH—CH=CH—

and

$(R)_n$ represents substitution on the nucleus of members selected from the group consisting of

(α) 2 or 3 hydroxyl groups,

(β) from 1 to 3 alkyl groups each having from 1 to 4 carbon atoms,

(γ) 1 or 2 alkyl groups each having from 1 to 4 carbon atoms, conjointly with a hydroxyl group, and

(δ) an alkoxy group having from 1 to 4 carbon atoms, one of which members may occupy the X_2 position,

and (2) di-(2-chloroethoxy)-methane.

3,961,041
EFFERVESCENT ENTERIC COATED L-DOPA FORMULATION AND METHOD OF USING THE SAME

Kenji Nishimura; Mikio Arai; Kunihiro Sasahara, and Takashi Nitanai, all of Tokyo, Japan, assignors to Interx Research Corporation, Lawrence, Kans.

Filed Apr. 10, 1975, Ser. No. 566,745

Claims priority, application Japan, Nov. 14, 1974, 49-131304

Int. Cl.² A61K *9/22, 9/46, 9/30*

U.S. Cl. 424—35 **8 Claims**

1. A pharmaceutical effervescent enteric-coated tablet for oral administration to a warm-blooded animal which permits release and absorption of L-DOPA in the area of the upper portion of the small intestine thereof comprising a tableted admixture of:

a. a member selected from the group consisting of L-DOPA, 3,4-diacetyloxy-L-phenylalanine or a pharmaceutically acceptable acid addition salt thereof, 3,4-dipivaloyloxy-L-phenylalanine or a pharmaceutically acceptable acid addition salt thereof, 3,4-dihydroxy-L-phenylalanine

methyl ester or a pharmaceutically acceptable acid addition salt thereof, 3,4-diacetyloxy-L-phenylalanine methyl ester or a pharmaceutically acceptable acid addition salt thereof, 3,4-dihydroxy-L-phenylalanine benzyl ester or a pharmaceutically acceptable acid addition salt thereof, 3,4-diacetyloxy-L-phenylalanine benzyl ester or a pharmaceutically acceptable acid addition salt thereof, glycyl-3,4-diacetyloxy-L-phenylalanine methyl ester or a pharmaceutically acceptable acid addition salt thereof, 3,4-dipivalyloxy-N(1-methyl-2-acetylvinyl)-L-phenylalanine pivalyloxy methyl ester, the alkali metal salt of 3,4-dipivalyloxy-N(1-methyl-2-acetylvinyl)-L-phenylalanine, the alkali metal salt of 3,4-diacetyloxy-N(1-methyl-2-acetylvinyl)-L-phenylalanine, N-formyl-3,4-dipivalyloxy-L-phenylalanine, N-formyl-3,4-dipivalyloxy-L-phenylalanine-pivalyloxymethyl ester, N-formyl-3,4-diacetyloxy-L-phenylalanine, the alkali metal salt of N-formyl-3,4-diacetyloxy-L-phenylalanine, glycyl-3,4-diacetyloxy-L-phenylalanine or a pharmaceutically acceptable acid addition salt thereof, 3,4-diacetyloxy-L-phenylalanylglycine or a pharmaceutically acceptable acid addition salt thereof, 3,4-dihydroxy-L-phenylalanyl-3,4-dihydroxy-L-phenylalanine or a pharmaceutically acceptable acid addition salt thereof, 3,4-diacetyloxy-L-phenylalanyl-3,4-diacetyloxy-L-phenylalanine methyl ester or a pharmaceutically acceptable acid addition salt thereof, and 3,4-diacetyloxy-L-phenylalanyl-3,4-diacetyloxy-L-phenylalanine benzyl ester or a pharmaceutically acceptable acid addition salt thereof,

b. a non-toxic pharmaceutically acceptable inert diluent,

c. a non-toxic pharmaceutically acceptable effervescent couple acid and base, and

d. a non-toxic pharmaceutically acceptable enteric coating over said entire tableted admixture.

3,961,042

QUATERNARY AMMONIUM CO-POLYMERS FOR CONTROLLING THE PROLIFERATION OF BACTERIA

Harold A. Green, Havertown, Pa.; John J. Merianos, Jersey City, and Alfonso N. Petrocci, Glen Rock, both of N.J., assignors to Millmaster Onyx Corporation, New York, N.Y.

Division of Ser. No. 511,759, Oct. 3, 1974, Pat. No. 3,928,328, which is a continuation-in-part of Ser. No. 425,931, Dec. 18, 1973, Pat. No. 3,874,870. This application July 7, 1975, Ser. No. 593,734

Int. Cl.² A61K *31/495, 31/535, 31/155*

U.S. Cl. 424—78 **2 Claims**

1. A method of controlling the proliferation of bacteria which comprises applying to said bacteria an effective amount sufficient to inhibit their growth, of a product formed by the condensation of a mixture of difunctional tertiary amines and a molar quantity of 1,4-dichloro-2-butene that is substantially equal to the molar sum of the mixture of the difunctional tertiary amines, said mixture of difunctional tertiary amines being selected from the group consisting of (a) 1,4-bis-(morpholino)-2-butene and N,N'-di-lower alkyl piperazine, (b) 1,4-bis-(dimethylamino)-2-butene and 1,4-bis-(N-morpholino)-2-butene, and (c) 1,4-bis-(dimethylamino)-2-butene, N,N'-di-lower alkyl piperazine and 1,4-bis-(N-morpholino)-2-butene.

3,961,043

DEODORIZED PESTICIDAL ORGANOTHIOPHOSPHORUS COMPOUNDS

Arthur J. Huvar, Richmond, Va., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 12, 1970, Ser. No. 63,293

Int. Cl.² A01N *9/36*

U.S. Cl. 424—76 **11 Claims**

1. A pesticidal composition comprising (1) from about 0.0001 to about 80% by weight of a malodorous compound selected from the group consisting of S,S-dipropyl O-ethyl phosphorodithioate and S-(1,2-dicarbethoxyethyl)O,O-dimethyldithiophosphate, (2) an amount sufficient to deodorize said malodorous compound comprising from about 5 to about 40% by weight of the malodorous compound of a material selected from the group consisting of linoleic acid, linolenic acid and linseed oil, and (3) a liquid or solid carrier.

3,961,044

SKIN PROTECTIVE COMPOSITIONS

Ralph Kelly, Cincinnati, and Edmond Jean Ritter, Loveland, both of Ohio, assignors to Cincinnati Milacron, Inc., Cincinnati, Ohio

Division of Ser. No. 46,561, June 15, 1970, which is a continuation-in-part of Ser. No. 696,509, Jan. 9, 1968, Pat. No. 3,630,934, which is a continuation-in-part of Ser. No. 613,095, Feb. 1, 1967, Pat. No. 3,538,009. This application Feb. 4, 1974, Ser. No. 439,081

Int. Cl.² A61K *31/74*

U.S. Cl. 424—78 **9 Claims**

1. A skin protective lotion or creme consisting essentially of a skin irritation reducing effective amount of a protective agent and a non-aqueous emollient, humectant or surfactant; said lotion or creme capable of reducing skin irritation compared to said lotion or creme without protective agent when applied to the skin prior to contact with a skin irritant; said protective agent being dispersible in said lotion or creme; said protective agent selected from the group consisting of esters and polyesters of polycarboxylic acids and hydroxy containing polyoxyalkylene ethers in which said polycarboxylic acids contain one cycloaliphatic or aromatic ring of 5 to 7 carbon atoms or a naphthalene ring; and said hydroxy containing polyoxylakylene ethers contain to 30 oxyalkylene units in which the alkylene radical contains 2 to 4 carbon atoms containing two polar groups which are separated by a chain of at least 15 atoms a majority of which are carbon; said protective agent containing polar groups selected from the groups consisting of hydroxyl and carboxyl.

3,961,045

METHOD OF TREATING ULCER

Otto B. Wurzburg, Whitehouse Station; Chester D. Szymanski, Martinsville, and Leo Kruger, Kendall Park, all of N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Division of Ser. No. 408,317, Oct. 23, 1973, Pat. No. 3,893,890. This application Mar. 17, 1975, Ser. No. 558,913

Int. Cl.² A61K *31/74*

U.S. Cl. 424—78 **1 Claim**

1. A method for treating gastric or duodenal ulcers in humans in need of such treatment comprising administering orally thereto an effective amount within the range of from 0.020 to 1.000 grams of a water-soluble polymer selected from the group consisting of sulfonated homo- and copolymers of styrene and salts thereof having a degree of substitution from about 0.7 to about 1.3 sulfonate groups per unit of styrene and an average molecular weight within the range of 600 to 7,000,000.

3,961,046

MUMPS VACCINE AND PREPARATION THEREOF

Costantino Peter Cerini, Pearl River, N.Y., assignor to American Cyanamid Company, Stamford, Conn.

Filed Dec. 2, 1974, Ser. No. 528,752

Int. Cl.² A61K *39/12;* **C12K** *5/00, 7/00*

U.S. Cl. 424—89 **7 Claims**

1. A mumps vaccine comprising:

A. as its essential ingredient an immunologically effective amount of an attenuated mumps virus characterized by

a. when injected into humans

i. being free of clinical manifestatins of the disease and

ii. invoking in man an antibody response to a virulent virus;

b. being capable of inducing its own replication in living cells; and

c. having been attenuated from virulent mumps virus by three serial passages in primary human amnionic cell monolayers at 34°C. to 37°C., followed by one passage in embryonated chicken eggs at 34°C. to 37°C., followed by replication in chick embryo tissue at 32°C. to 37°C. for from 8 through 28 passages; and

B. a stabilizer.

6. A process of preparing a live mumps virus useful as an antigen in a vaccine which will evoke in man an antibody response against a virulent mumps virus without causing the severe clinical manifestations of the disease which comprises growing the virulent virus by three serial passages in primary human amnionic cell monolayers at 34°C. to 37°C., followed by one passage in embryonated chicken eggs at 34°C. to 37°C., followed by replication in chick embryo tissue at 32°C. to 37°C. for from 8 through 28 passages.

3,961,047

ESTERS OF PARTRICIN DERIVATIVES

Tiberio Bruzzese, and Giuseppe Ghielmetti, both of Milan, Italy, assignors to SPA-Societa Prodotti Antibiotici S.p.A., Italy

Filed Feb. 13, 1974, Ser. No. 441,988

Claims priority, application United Kingdom, Feb. 15, 1973, 7488/73

Int. Cl.² A61K *35/74*

U.S. Cl. 424—122 **3 Claims**

1. The C_{1-6} alkyl esters of N-substituted partricin wherein the N-substituents are C_{1-6} alkyl or C_{1-6} carboxylic acyl.

3,961,048

WATER-SOLUBILIZED ANTIBIOTICS

Ernani Dell'Acqua, and Rodolfo Ferrari, both of Milan, Italy, assignors to SPA-Societa prodotti Antibiotici S.p.A., Milan, Italy

Filed May 14, 1974, Ser. No. 469,889

Claims priority, application United Kingdom, May 14, 1973, 22848/73

Int. Cl.² A61K *35/74*

U.S. Cl. 424—122 **3 Claims**

1. A water-soluble pharmaceutical complex obtained by dissolving an antibiotic selected from the group consisting of partricin and partricin methyl ester in an aqueous solution containing a surfactant selected from the group consisting of benzalkonium chloride, sodium lauryl sulphate and sodium tetradecyl sulphate wherein the weight ratio of the antibiotic to the surfactant is 1 to 10, stirring the mixture thus-obtained to form a complex and isolating the complex by lyophilisation or precipitation.

3,961,049

METHOD FOR CONTROLLING MITES AND THIOUREIDOBENZENE PHOSPHATES

Tetsuo Horii; Isao Chiyomaru, both of Shimizu; Seigo Kawada, Fujieda, and Kiyoshi Takita, Shimizu, all of Japan, assignors to Kumiai Chemical Industry Co., Ltd., Tokyo, Japan

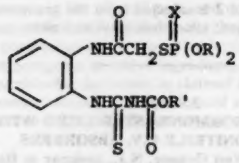
Division of Ser. No. 349,175, April 9, 1973, Pat. No. 3,903,271. This application Jan. 10, 1975, Ser. No. 540,227

Claims priority, application Japan, Apr. 18, 1972, 47-39020

Int. Cl.² C07F *9/165;* **A01N** *9/36*

U.S. Cl. 424—211 **8 Claims**

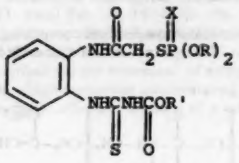
1. A method of controlling mites which comprises applying a miticidally effective amount of a thioureidobenzene compound having the formula



wherein R and R′ are lower alkyl groups and X is oxygen or sulfur atom

to plants.

2. A thioureidobenzene compound having the formula



wherein R is an alkyl group having 1 to 4 carbon atoms, R′ is methyl or ethyl and X represents oxygen or sulfur atom.

3,961,050

INSECTICIDAL COMPOSITIONS AND METHODS OF KILLING INSECTS USING BENZYLTHIOMETHYLENEPHOSPHONAMIDATES AND PHOSPHORAMIDATES

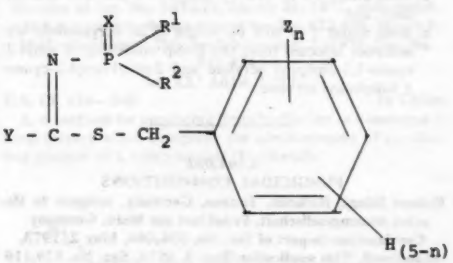
Leonard J. Stach, Riverside, Ill., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Division of Ser. No. 485,190, July 1, 1974, Pat. No. 3,911,057. This application May 16, 1975, Ser. No. 578,059

Int. Cl.² A01N *9/36*

U.S. Cl. 424—216 **2 Claims**

1. An insecticidal composition comprising an inert carrier and, as an essential active ingredient, in a quantity toxic to insects, a compound of the formula



wherein Y is selected from the group consisting of hydrogen and alkyl of from 1 to 3 carbon atoms; X is selected from the group consisting of oxygen and sulfur; R^1 and R^2 are independently selected from the group consisting of lower alkyl, lower alkoxy, lower alkylthio, provided a maximum of one of R^1 and

R^2 is lower alkyl; and Z is selected from the group consisting of lower alkyl, halogen, lower haloalkyl and nitro.

3,961,051

JUVENILE HORMONES STABILIZED WITH ACRYLONITRILE U.V. ABSORBERS

Alexander Emodi, West Orange, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

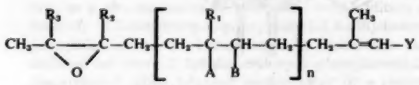
Continuation-in-part of Ser. No. 323,494, Jan. 15, 1973, abandoned, which is a continuation-in-part of Ser. No. 180,100, Sept. 13, 1971, abandoned. This application Sept. 20, 1974, Ser. No. 508,015

Int. Cl.² A01N 9/28

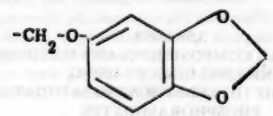
U.S. Cl. 424—174 **12 Claims**

1. A stabilized insecticide composition comprising;

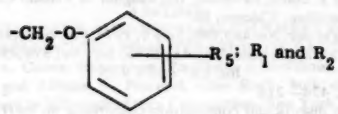
a. from about 10 to 75 weight percent of a juvenile hormone of the formula:



wherein Y is $-COOR_4$, $-CH_2-O-C\equiv CH$,



or



are hydrogen, methyl or ethyl; R_3 is methyl or ethyl; R_4 and R_5 are hydrogen or lower alkyl; *n* is an integer of from 0 to 1; and A and B are hydrogen or are taken together to form a carbon to carbon bond;

b. from about 1% to 25% by weight of a phenolic anti-oxidant; and

c. from about 1 to 20% by weight of an acrylonitrile u.v. absorber selected from the group consisting of ethyl-2-cyano-3,3-diphenyl acrylate and 2-ethyl-hexyl-2-cyano-3,3-diphenyl acrylate.

3,961,052

FUNGICIDAL COMPOSITIONS

Helmut Stingl, Hofheim, Taunus, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

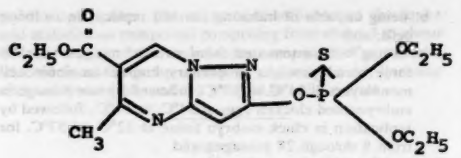
Continuation-in-part of Ser. No. 356,404, May 2, 1973, abandoned. This application Dec. 3, 1974, Ser. No. 529,119

Claims priority, application Germany, May 5, 1972, 2222133

Int. Cl.² A01N 9/02, 9/22, 9/36

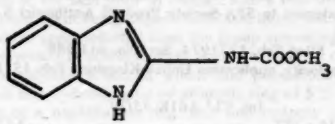
U.S. Cl. 424—200 **11 Claims**

1. A fungicidal composition comprising synergistic proportions of a mixture of active ingredients and carrier, said active ingredients comprising 2 to 70% by weight of said composition, said synergistic proportions of active ingredients consisting of a ratio of 10:1 to 1:10 of 2-(O,O-diethyl-thionophosphoryl)-5-methyl-6-carbethoxy-pyrazolo-(1,5*a*)-pyrimidine of the formula



I

in admixture with 2-methoxycarbonylamino-benzimidazole of the formula



II

3,961,053

SUBSTITUTED CARBINOL DERIVATIVES

Eugene E. Galantay, Liestal, Switzerland, and Dietmar A. Habeck, Heidelberg, Germany, assignors to Sandoz, Inc., E. Hanover, N.J.

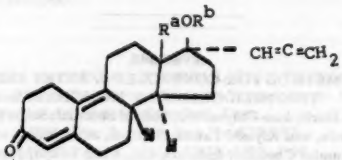
Continuation of Ser. No. 358,345, May 8, 1973, abandoned, which is a continuation-in-part of Ser. No. 314,833, Dec. 13, 1972, abandoned, which is a division of Ser. No. 71,279, Sept. 10, 1970, Pat. No. 3,719,670, which is a continuation-in-part of Ser. No. 778,777, Nov. 25, 1968, abandoned. This application Nov. 18, 1974, Ser. No. 524,620

The portion of the term of this patent subsequent to Mar. 6, 1990, has been disclaimed.

Int. Cl.² C07J 1/00

U.S. Cl. 424—243 **14 Claims**

1. A pharmaceutical composition suitable for internal administration comprising an amount of a compound of the formula



wherein

R^a is alkyl having 1 to 3 carbon atoms; and

R^b is a hydrogen atom, methyl, acetoacetyl or lower alkanoyl having 2 to 4 carbon atoms effective in controlling fertility in a mammal and a pharmaceutical carrier.

3,961,054

COMBATTING DANDRUFF WITH MERCAPTO QUINOLINE N-OXIDES

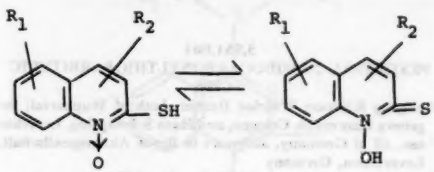
Thomas E. Furia, Hartsdale, and David H. Steinberg, Bronx, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 325,712, Jan. 22, 1973, Pat. No. 3,862,151, which is a division of Ser. No. 842,377, July 16, 1969, Pat. No. 3,723,435. This application Dec. 27, 1974, Ser. No. 536,771

Int. Cl.² A61K *31/47*

U.S. Cl. 424—245 12 Claims

1. An anti-dandruff shampoo comprising an aqueous detergent base in liquid or paste form and an amount sufficient to provide effective anti-dandruff control on the hair and scalp of a salt or complex of a metal selected from the group consisting of lithium, sodium, potassium, zinc, calcium, tin, copper, antimony, lead, manganese, and aluminum of a compound having the following structural formula in tautomeric form:



wherein R_1 and R_2 are each independently selected from the group consisting of hydrogen, alkyl of one to 24 carbon atoms, phenyl, phenyl substituted with chlorine or methyl, halogen, trifluoromethyl and alkoxy of one to four carbon atoms.

3,961,055

HYDROXY AND ETHER CONTAINING PHENOTHIAZINE DERIVATIVES

Jean Baget, Sceaux, France, assignor to Rhone-Poulenc Industries, Paris, France

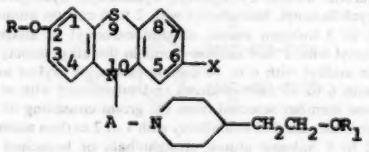
Filed Jan. 21, 1975, Ser. No. 542,799

Claims priority, application France, Jan. 22, 1974, 74.02101; Nov. 12, 1974, 74.37295

Int. Cl.² A61K *27/00*; C07D *279/28*

U.S. Cl. 424—247 12 Claims

1. A phenothiazine derivative of the formula:



wherein X represents methylthio, methylsulphonyl or dimethylsulphamoyl, R represents hydrogen, alkyl of 1 through 10 carbon atoms, phenylalkyl containing 1 through 4 carbon atoms in the alkyl part, or tetrahydropyranyl, A represents $-(CH_2)_3-$ or $-CH_2-CH(CH_3)-CH_2-$, and R_1 represents hydrogen, alkanoyl containing 1 through 16 carbon atoms in the alkyl part, or alkenoyl containing 2 to 16 carbon atoms in the alkenyl part, and non-toxic pharmaceutically acceptable acid addition salts thereof.

12. A pharmaceutical composition having anti-emetic activity which comprises as active ingredient, an effective amount of a phenothiazine derivative as claimed in claim 1, or a non-toxic pharmaceutically acceptable acid addition salt thereof, in association with a significant amount of a pharmaceutical carrier.

3,961,056

SUBSTITUTED MORPHOLINE GUANIDINES FOR THE TREATMENT OF ARRHYTHMIC CONDITIONS

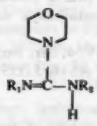
Donald W. DuCharme, Cooper Township, Kalamazoo County, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Feb. 11, 1974, Ser. No. 441,399

Int. Cl.² A61K *31/535*

U.S. Cl. 424—248 11 Claims

1. A method for the treatment of arrhythmic conditions in mammals which comprises administering to said mammal an anti-arrhythmic effective amount of a compound of the formula



wherein R_1 and R_2 are the same or different and are selected from the group consisting of alkyl of from four to seven carbon atoms, inclusive cycloalkyl of from five to seven carbon atoms, inclusive, phenyl, phenalkyl with alkyl of from one to three carbon atoms, inclusive, and mono-substituted phenyl and phenyl moiety of the phenalkyl wherein the substituent is selected from the group consisting of alkyl of one to three carbon atoms, inclusive, alkoxy of from one to three carbon atoms, inclusive, halogen, and trifluoromethyl; and pharmaceutically acceptable acid addition salts thereof in association with a pharmaceutical carrier.

3,961,057

BENZOPYRANO(3,4-C)PYRIDINE BRONCHODILATORS

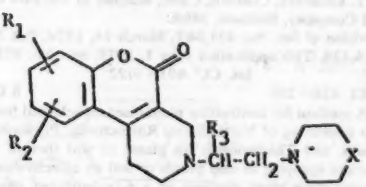
Richard E. Brown, Hanover, and John Shavel, Jr., Mendham, both of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 343,613, March 23, 1973, abandoned, which is a continuation-in-part of Ser. No. 122,498, March 9, 1971, abandoned. This application Jan. 3, 1975, Ser. No. 538,424

Int. Cl.² A61K *31/535*

U.S. Cl. 424—248 10 Claims

1. A method for producing bronchodilation in a mammal in need thereof which comprises the administration of an effective amount of a compound of the formula:



wherein R_1 and R_2 are hydrogen, hydroxyl or lower alkoxyl of from 1 to 6 carbon atoms; R_3 is hydrogen or lower alkyl of 1

to 6 carbon atoms and x is oxygen, sulfur, methylene or nitrogen substituted by hydrogen, lower alkyl of 1 to 6 carbon atoms or lower alkanoyl of 1 to 6 carbon atoms, to said mammal.

3,961,058

ANTIDEPRESSANT MEDICINAL PREPARATION

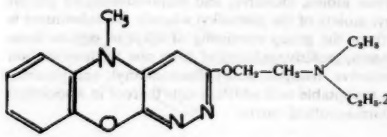
Tatyana Vladimirovna Gortinskaya, proezd Serova, 3, kv. 47; Mikhail Davidovich Mashkovsky, Leningradsky prospekt, 75a, kv. 55; Antonina Ivanovna Polezhaeva, 13 Parkovaya ulitsa, 25, korpus 1, kv. 44; Valentina Georgievna Nyrkova, Khersonskaya ulitsa, 7, korpus 1, kv. 20; Larisa Nikolaevna Bondar, ulitsa Gorkogo, 53, kv. 42; Galina Nikolaevna Litova, Novo-Khoroshevskoe shosse, 53, kv. 31, all of Moscow, U.S.S.R.; Maria Nikolaevna Schukina, deceased, late of Moscow, U.S.S.R., and Maria Nikolaevna Preobrazhenskaya, administrator, Rostovskaya naberezhnaya, 3, kv. 105, Moscow, U.S.S.R.

Filed Apr. 22, 1974, Ser. No. 463,169

Int. Cl.[2] A61K *31/535*

U.S. Cl. 424—248 **6 Claims**

1. An antidepressant medicinal composition, consisting essentially of an effective amount of the compound dihydrochloride 2-(2′-diethylaminoethoxy)-10-methyl-3,4-diazaphenoxazine of the following formula:



combined with a pharmaceutical carrier.

3,961,059

6-(SUBSTITUTED PHENOXY)TETRAZOLO(1,5-b)PYRIDAZINES AND A METHOD OF USE FOR CONTROL OF SOIL-BORNE PLANT DISEASES

Fred Y. Edamura, Concord, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 451,667, March 14, 1974, Pat. No. 3,914,228. This application May 1, 1975, Ser. No. 573,707

Int. Cl.[2] A01N *9/22*

U.S. Cl. 424—250 **8 Claims**

1. A method for controlling plant diseases selected from the group consisting of Verticillium, Rhizoctonia, Phytophthora, Pythium, and Thielaviopsis on plants or soil thereof which comprises applying to said plants or soil an effective amount for controlling plant diseases of a 6-(substituted phenoxy) tetrazolo (1, 5-b)-pyridazine compound wherein said substituted phenoxy moiety is selected from the group consisting of 4-nitrophenoxy, 4-chlorophenoxy and 4-chloro-2-nitrophenoxy.

3,961,060

METHOD AND COMPOSITIONS FOR THE TREATMENT OF NEUROLOGICAL DISORDERS

Kjell Gunnar Fuxe, Sollentuna, Sweden, assignor to Astra Lakemedal Aktiebolag, Sodertalje, Sweden

Filed May 15, 1974, Ser. No. 469,954

Claims priority, application Sweden, May 17, 1973, 73069601

Int. Cl.[2] A61K *31/52, 31/195*

U.S. Cl. 424—253 **26 Claims**

1. A method for alleviating depression and ailments which are related to a decreased activity of the dopamine system in the brain, comprising concurrently administering to a host in need of such treatment dopa and a dopa-potentiating amount of caffeine, the relative proportions of dopa and caffeine, calculated on a basis of the total weight of dopa and caffeine, being between about twenty to eighty percent by weight of dopa and about eighty to twenty percent by weight of caffeine.

3,961,061

PESTICIDAL 2-AMIDOCARBONYLTHIOBARBITURIC ACIDS

Wolfgang Krämer; Wilfried Draber, both of Wuppertal; Ingeborg Hammann, Cologne, and Hans Scheinpflug, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

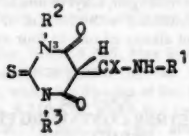
Filed Feb. 5, 1975, Ser. No. 547,421

Claims priority, application Germany, Feb. 7, 1974, 2405733

Int. Cl.[2] A01N *9/22*; C07D *239/00*

U.S. Cl. 424—254 **10 Claims**

1. A 2-amidocarbonylthiobarbituric acid of the formula



in which

R^1 is alkyl with 1 to 12 carbon atoms, alkoxyalkyl with 1 to 12 carbon atoms in the alkyl moiety and 1 to 3 carbon atoms in the alkoxy moiety, alkylthioalkyl with 1 to 6 carbon atoms in the alkyl moiety and 1 to 3 carbon atoms in the alkylthio moiety, haloalkyl with 1 to 12 carbon atoms in the alkyl moiety and 1 to 3 halogen atoms, cyclopentylmethyl, cyclohexylmethyl, alkenyl with 2 to 6 carbon atoms, cyclopentyl, cyclohexyl, cyclopentenyl, cyclohexenyl, haloalkenyl with 2 to 6 carbon atoms and 1 to 3 halogen atoms, alkylthiocarbonyl or alkoxycarbonyl with 1 to 4 carbon atoms in the alkyl moiety, aryl or aralkyl with 6 to 10 carbon atoms, or aryl or aralkyl with 6 to 10 carbon atoms and substituted with at least one member selected from the group consisting of halogen, haloalkyl or haloalkoxy with 1 or 2 carbon atoms and 2 to 5 halogen atoms, straightchain or branched alkyl with 1 to 4 carbon atoms, alkoxy or alkylthio with 1 to 4 carbon atoms, alkylsulfonyl with 1 to 4 carbon atoms and nitro,

R^2 and R^3 each independently is alkyl with 1 to 6 carbon atoms, alkenyl with 2 to 6 carbon atoms, cyclopentyl, cyclohexyl, phenyl, benzyl or hydrogen, provided that not more than one R^2 and R^3 is hydrogen, and

X is oxygen or sulfur.

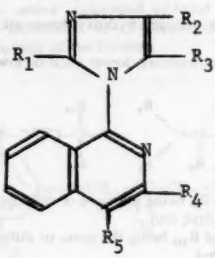
3,961,062

PHARMACEUTICAL COMPOSITION CONTAINING 1-(IMIDAZOLE-1-YL)-ISOQUINOLINES AND METHOD OF TREATING HYPERLIPEMIA

Ulrich Lerch, Hofheim, Taunus, and Ernold Granzer, Kelkheim, Taunus, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Division of Ser. No. 454,713, March 25, 1974, Pat. No. 3,914,236. This application Mar. 26, 1975, Ser. No. 562,048
Claims priority, application Germany, Mar. 26, 1973, 231498
Int. Cl.² A61K *31/47*
U.S. Cl. 424—258 18 Claims

1. A pharmaceutical composition having hypolipemic and hypoglycemic activity consisting essentially of a physiologically tolerable carrier and, as the essential active compound, about 3 to 200 mg/kg per daily dosage unit of a 1-(1-imidazolyl)-isoquinoline of the formula



or a physicologically tolerated salt thereof, wherein R_1, R_2, and R_3, which may be the same or different, are hydrogen, alkyl of 1 to 4 carbon atoms, or phenyl, but R_2 and R_3 are not both alkyl; R_4 is hydrogen, alkyl of 1 to 4 carbon atoms, phenyl, or chlorine; and R_5 is hydrogen, alkyl of 1 to 6 carbon atoms, cycloalkyl of 5 to 8 carbon atoms, phenyl, or chlorine, but R_4 and R_5 are not both t-alkyl.

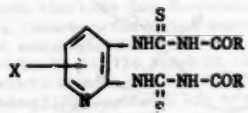
3,961,063

2,3-BIS-(3-ACYL-2-THIOUREIDO)-PYRIDINES

Roger C. Parish, King of Prussia, Pa., assignor to SmithKline Corporation, Philadelphia, Pa.

Filed Apr. 3, 1975, Ser. No. 565,026
Int. Cl.² C07D *213/53*
U.S. Cl. 424—263 9 Claims

1. A compound of the formula:



in which R is lower alkoxy; and X is hydrogen, lower alkyl, trifluoromethyl, halo, lower alkoxy, benzoyl, lower alkylthio, lower alkylsulfonyl, phenyloxy or phenylthio.

9. An anthelmintic composition comprising an anthelmintically effective but nontoxic quantity of a compound as claimed in claim 1, dispersed uniformly throughout an inert carrier in amounts selected from the range of 1 to 300 mg./kg. per dosage unit.

3,961,064

PHARMACEUTICAL COMPOSITION FOR REMEDY OF HYPERAMMONIEMIA

Toji Konishi, Tokyo; Masanori Kayano, Honjo, and Yoshio Tanabe, Fujimi, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

Filed Nov. 21, 1974, Ser. No. 525,744
Claims priority, application Japan, Nov. 21, 1973, 48-130123
Int. Cl.² A61K *31/455*
U.S. Cl. 424—266 6 Claims

1. A method of lowering the blood-ammonia level in humans suffering from liver disease and having hyperammoniemia as a consequence thereof, which comprises:

administering to such a human from 200 to 2400 mg per day of nicotinohydroxamic acid in the form of divided doses of a therapeutic composition containing nicotinohydroxamic acid with a pharmaceutically acceptable carrier, diluent or vehicle.

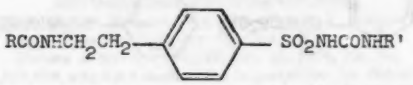
3,961,065

BENZENESULFONYLUREA DERIVATIVES

Donald E. Kuhla, Gales Ferry, and Reinhard Sarges, Mystic, both of Conn., assignors to Pfizer Inc., New York, N.Y.

Division of Ser. No. 357,466, May 4, 1973, Pat. No. 3,879,403. This application Jan. 30, 1975, Ser. No. 545,741
Int. Cl.² A61K *31/455*
U.S. Cl. 424—266 14 Claims

1. A method for lowering blood sugar in the treatment of a diabetic animal, which comprises orally administering to said animal an effective blood sugar lowering amount of a compound selected from the group consisting of benzenesulfonylureas of the formula:



and the base salts thereof with pharmacologically acceptable cations, wherein R is 2-methoxy-3-pyridyl, 5-chloro-2-methoxy-3-pyridyl or 5-bromo-2-methoxy-3-pyridyl, and R′ is bicyclo-[2.2.1]hept-5-en-2-yl-endo-methyl, cyclohexyl or 4-chlorocyclohexyl.

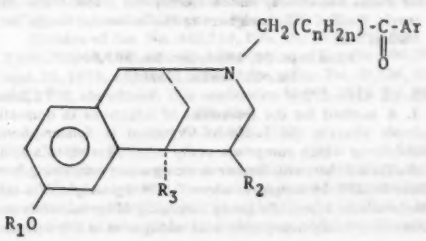
3,961,066

6,7-BENZOMORPHAN DERIVATIVES

Toshitsugu Fukumaru, Kyoto; Kenji Kobayashi, Takarazuka; Hiroyuki Mizote, Takarazuka; Shigeho Inaba, Takarazuka, and Hisao Yamamoto, Nishinomiya, all of Japan, assignors to Sumitomo Chemical Company, Limited, Japan

Filed Mar. 29, 1974, Ser. No. 456,268
Claims priority, application Japan, Mar. 31, 1973, 48-37333
Int. Cl.² C07D *221/26*
U.S. Cl. 424—267 16 Claims

1. A 6,7-benzomorphan of the formula:



and non-toxic, pharmaceutically acceptable acid addition salts thereof, wherein R_1 is a hydrogen atom, a lower alkyl group, C_2-C_6 alkanoyl, benzoyl or nicotinoyl, R_2 and R_3 are each a lower alkyl group, Ar is a phenyl group, a halophenyl group or a lower alkoxyphenyl group and n is an integer of 1 or 2.

3,961,067

COMPOSITION COMPRISING A BENZENESULFONYLUREA HYPOGLYCEMIC AGENT AND METHOD OF TREATMENT

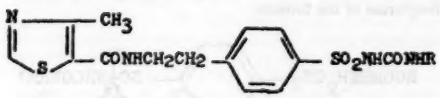
Donald E. Kuhla, Gales Ferry; Reinhard Sarges, Mystic, and Hans E. Wiedermann, Niantic, all of Conn., assignors to Pfizer Inc., New York, N.Y.

Division of Ser. No. 338,965, March 7, 1973, Pat. No. 3,856,806. This application Oct. 21, 1974, Ser. No. 516,372

Int. Cl.² A61K *31/425*

U.S. Cl. 424—270 **7 Claims**

1. A method for lowering blood sugar in the treatment of a diabetic animal, which comprises orally administering to said animal an effective blood sugar lowering amount of a compound selected from the group consisting of a benzenesulfonylurea of the formula:



and a base salt thereof with a pharmacologically acceptable cation, wherein R is bicyclo [2.2.1]hept-5-en-2-yl-endomethyl or cycloalkyl of from five to seven carbon atoms.

3,961,068

USE OF IPRONIDAZOLE IN COMBATTING *SPHAEROPHORUS NECROPHORUS* INFECTIONS

Gian Paolo Maestrone, Staten Island, N.Y., and Milan Mitrovic, Nutley, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Sept. 30, 1974, Ser. No. 503,560

Int. Cl.² A61K *31/415*

U.S. Cl. 424—273 **7 Claims**

1. A method for the treatment of infections in domestic animals wherein the causative organism is *Sphaerophorus necrophorus* which comprises orally administering to an animal afflicted therewith feed or drinking water containing from about 0.005% by weight to about 0.03% by weight of a substance selected from the group consisting of ipronidazole and pharmaceutically acceptable acid addition salts thereof.

3,961,069

AKENYL(OR ALKYNYL) 9-XANTHENYL ETHER COMPOUNDS

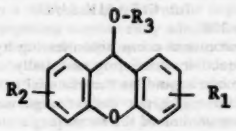
Paul E. Bender, Willingboro, N.J., and Bernard Loev, Broomall, Pa., assignors to SmithKline Corporation, Philadelphia, Pa.

Filed Apr. 23, 1975, Ser. No. 570,905

Int. Cl.² C07D *311/84*

U.S. Cl. 424—283 **7 Claims**

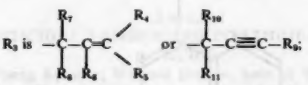
1. A compound of the formula:



in which:

R_1 is hydrogen, halogen hydroxy, lower alkyl or lower alkoxy;

R_2 is hydrogen, hydroxy, lower alkyl or lower alkoxy;



R_4, R_5, R_6 and R_9, being the same or different, are hydrogen, methyl or ethyl; and

R_7, R_8, R_{10} and R_{11}, being the same or different, are hydrogen or methyl.

3,961,070

PESTICIDAL DIHALOVINYL-SPIROALKANECYCLOPROPANE DERIVATIVES

Royston H. Davis, Rainham, and Robert J. G. Searle, Rodmersham Green near Sittingbourne, both of England, assignors to Shell Oil Company, Houston, Tex.

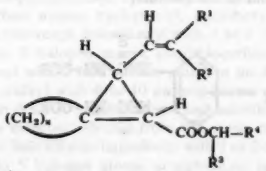
Filed Mar. 24, 1975, Ser. No. 561,573

Claims priority, application United Kingdom, Dec. 3, 1974, 52224/74

Int. Cl.² A01N *9/20, 9/24*; C07C *121/75*

U.S. Cl. 424—304 **7 Claims**

1. A dihalovinyl-spiroalkanecyclopropane derivative of the formula



wherein R^1 and R^2 independently each represents a halogen atom; R^3 represents a cyano group; R^4 represents phenyl substituted by phenoxy and *n* is an integer of from 2 to 5.

7. A method of combating pests at a locus which comprises applying to the locus a pesticidally active amount of a dihalovinyl-spiroalkanecyclopropane derivative as claimed in claim 1 or a composition thereof.

3,961,071

THERAPEUTIC COMPOSITIONS AND METHOD

Herbert Koppe, Ingelheim am Rhein; Albrecht Engelhardt, Mainz, Rhine, and Karl Zeile, Ingelheim am Rhein, all of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Germany

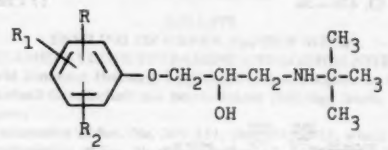
Division of Ser. No. 502,634, Sept. 3, 1974, which is a division of Ser. No. 408,743, Oct. 23, 1973, Pat. No. 3,868,460, which is a division of Ser. No. 294,226, Oct. 2, 1972, which is a division of Ser. No. 36,676, May 12, 1970, Pat. No. 3,740,444, which is a continuation-in-part of Ser. No. 700,376, Jan. 25, 1968, Pat. No. 3,541,130. This application Apr. 2, 1975, Ser. No. 564,308

Claims priority, application Germany, Feb. 6, 1967, 91070; June 15, 1967, 93025; July 25, 1967, 93645; June 15, 1967, 27645

Int. Cl.² A61K *31/195*

U.S. Cl. 424—319 **6 Claims**

1. A composition having bradycardia and isoproterenol antagonistic activity comprising a small but effective amount of at least one active compound selected from the group consisting of racemates of 1-phenoxy-2-hydroxy-3-tert.-butylamino propanes of the formula



wherein R is COOH; R_1 is selected from the group consisting of hydrogen, alkoxy and alkylthio of 1 to 4 carbon atoms and alkenyl and alkynyl of 2 to 4 carbon atoms and R_2 is selected from the group consisting of hydrogen, halogen and alkyl and alkoxy of 1 to 4 carbon atoms, their optically active isomers and their non-toxic, pharmaceutically acceptable acid addition salts of said racemates and said optically active isomers and a major amount of a pharmaceutical carrier.

3,961,072

PHENOXYPROPANOLAMINE THERAPEUTIC AGENTS

David Alexander Cox, Canterbury; John Christopher Danilewicz, Sandwich; Allan Leslie Ham, Broadstairs; John Edward Glyn Kemp, Canterbury, and Michael Snarey, Sandwich, all of England, assignors to Pfizer Inc., New York, N.Y.

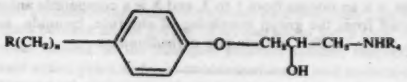
Division of Ser. No. 345,726, March 28, 1973, Pat. No. 3,845,123, which is a continuation of Ser. No. 98,168, Dec. 14, 1970, abandoned. This application Aug. 9, 1974, Ser. No. 496,288

Claims priority, application United Kingdom, Dec. 17, 1969, 61414/69; May 20, 1970, 24360/70

Int. Cl.² A61K *31/165*

U.S. Cl. 424—324 **6 Claims**

1. A method for effecting anti-anginal action in the treatment of a cardiac-afflicted subject, which comprises administering to said subject an effective anti-anginal amount of a compound selected from the group consisting of phenoxypropanolamine bases of the formula:



and the pharmaceutically acceptable acid addition salts thereof, wherein R of $R(CH_2)_n$ is alkanoylamino having from one to six carbon atoms when n is zero and is alkanoylamino having from one to three carbon atoms when n is one, said *n* being an integer of from 0 to 1, inclusive; R_1 is hydrogen, allyl or methyl, and R_4 is alkanoylaminophenoxyethyl having from one to six carbon atoms in the alkanoyl moiety.

3,961,073

ANTIDEPRESSANT

Solomon H. Snyder, Baltimore, Md., assignor to Nelson Research & Development Company, Irvine, Calif.

Continuation-in-part of Ser. No. 454,243, May 17, 1974, abandoned. This application July 1, 1975, Ser. No. 592,101

Int. Cl.² A61K *31/13*

U.S. Cl. 424—325 **10 Claims**

1. A method for temporarily alleviating the symptoms of depression in humans comprising internally administering to humans suffering from depression a composition comprising an effective amount of a compound selected from the group consisting of (−) trans-2-phenylcyclopropylamine and a non-toxic pharmaceutically acceptable acid addition salt thereof, said composition being substantially free of (+) trans-2-phenylcyclopropylamine.

3,961,074

KETO-QUATERNARY COMPOSITIONS

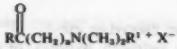
Robert Andrew Bauman, New Brunswick, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Division of Ser. No. 445,542, Feb. 25, 1974, Pat. No. 3,907,895, which is a continuation-in-part of Ser. No. 400,097, Sept. 24, 1973, which is a continuation of Ser. No. 39,536, May 21, 1970, abandoned. This application May 9, 1975, Ser. No. 576,082

Int. Cl.² A61K *7/22*

U.S. Cl. 424—54 **6 Claims**

1. A pharmaceutical composition comprising about 0.1–10% by weight of a chemical compound having the structural formula:



wherein R is 1-adamantyl, R^1 is a long chain alkyl group of 10 to 18 carbon atoms, n is an integer from 1 to 3, and X is a compatible anion selected from the group consisting of chloride, bromide, iodide, methyl sulfate, nitrite and arylsulfonates.

3,961,075

ETHER-LINKED QUATERNARY AMMONIUM COMPOSITIONS

Robert Andrew Bauman, New Brunswick, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Division of Ser. No. 445,714, Feb. 25, 1974, Pat. No. 3,898,284, which is a continuation-in-part of Ser. No. 400,097, Sept. 24, 1973, which is a continuation of Ser. No. 39,536, May 21, 1970, abandoned. This application May 9, 1975, Ser. No. 576,084

Int. Cl.² A61K *7/22*

U.S. Cl. 424—54 **6 Claims**

1. A pharmaceutical composition comprising about 0.1–10% by weight of a chemical compound having the structural formula: $RO(CH_2)_nN(CH_3)_2R^1 + X^-$ wherein R is 1-adamantyl, R^1 is a long chain alkyl group of 10 to 18 carbon

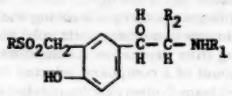
atoms, n is an integer from 1 to 3, and X is a compatible anion selected from the group consisting of chloride, bromide, iodide, methyl sulfate, nitrate and arylsulfonates.

3,961,076
α-AMINOALKYL-4-HYDROXY-3-ALKYLSULFONYL-METHYLBENZYL ALCOHOLS HAVING β-ADRENERGIC STIMULANT ACTIVITY

Carl Kaiser, Haddon Heights, N.J., and Stephen T. Ross, Berwyn, Pa., assignors to SmithKline Corporation, Philadelphia, Pa.

Division of Ser. No. 359,063, May 10, 1973, which is a continuation-in-part of Ser. No. 236,177, March 20, 1972, abandoned. This application July 18, 1975, Ser. No. 596,940
Int. Cl.² A61K *31/135*
U.S. Cl. 424—330 **10 Claims**

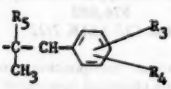
1. A pharmaceutical composition having β-adrenergic stimulant activity in dosage unit form comprising a pharmaceutical carrier and an effective amount of a chemical compound of the formula:



or a pharmaceutically acceptable acid addition salt of said compound, wherein:

R is straight or branched chain lower alkyl of from 1 to 5 carbon atoms;

R_1 is branched chain lower alkyl of from 3 to 5 carbon atoms, cycloalkyl or cycloalkylmethyl, the cycloalkyl moiety having from 3 to 6 carbon atoms, or

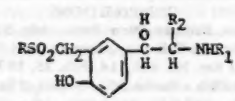


R_2 is hydrogen, methyl or ethyl;

R_3 and R_4 are hydrogen, hydroxy, or methoxy, and

R_5 is hydrogen or methyl.

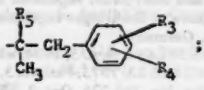
6. The method of producing β-adrenergic stimulant activity which comprises administering internally to animals requiring bronchodilation an amount sufficient to produce said activity a chemical compound of the formula:



or a pharmaceutically acceptable acid addition salt of said compound, wherein:

R is straight or branched chain lower alkyl of from 1 to 5 carbon atoms;

R_1 is branched chain lower alkyl of from 3 to 5 carbon atoms, cycloalkyl or cycloalkylmethyl, the cycloalkyl moiety having from 3 to 6 carbon atoms, or



R_2 is hydrogen, methyl or ethyl;

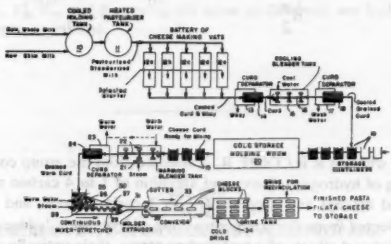
R_3 and R_4 are hydrogen, hydroxy, or methoxy, and

R_5 is hydrogen or methyl.

3,961,077
PASTA FILATA CHEESE PRODUCTION BY STORED CURD PROCESS

Lester O. Kielsmeier, Wheatridge, Colo., assignor to Leprino Cheese Manufacturing Company, Denver, Colo.

Continuation-in-part of Ser. No. 407,808, Oct. 19, 1973, abandoned. This application Apr. 10, 1975, Ser. No. 566,708
Int. Cl.² A23C *19/02*
U.S. Cl. 426—36 **17 Claims**



FLOW CHART FOR PASTA FILATA CHEESE PRODUCTION BY STORED CURD PROCESS

1. A process for preparing pasta filata cheese curd ready for mixing, comprising:

a. inoculating a batch of pasteurized cow's milk with a pasta filata starter culture providing an effective amount of *S. thermophilus* together with at least one high-temperature-growing *Lactobacillus;*

b. converting the milk batch to a mixture of curd and whey;

c. cooking the curd-whey mixture at a temperature of 100° to 125°F. favorable to the growth of said *S. thermophilus* and said *Lactobacillus;*

d. separating the resulting warm granular curd from the whey, said warm curd having an average internal pH of 5.5 to 6.2;

e. contacting the warm curd with water having a lower temperature than the curd until the curd is cooled to below 80°F.; and

f. holding the cooled granular curd in a cold storage room having an ambient air temperature above the freezing temperature of the curd and below 65°F. until the average internal pH of the curd has decreased to a pH of 5.1 to 5.4 suitable for mixing and stretching the curd to obtain pasta filata stringiness.

3,961,078

SOLUBLE WASTE CONVERSION PROCESS AND PASTEURIZED PROTEINACEOUS PRODUCTS

Paul A. Stitt, 1318 S. Eighth St., Manitowoc, Wis. 54220

Continuation of Ser. No. 326,228, Jan. 24, 1973, abandoned. This application Mar. 21, 1975, Ser. No. 560,748

Int. Cl.[2] A23C *5/00;* **A23K** *1/08;* **A23J** *1/20;* **C02C** *1/02*

U.S. Cl. 426—41 **18 Claims**

1. A process for treating soluble biodegradable organic waste material which comprises:

a. preparing a reaction mixture consisting essentially of soluble biodegradable organic waste material and a microorganism culture consisting of thermophilic aerobic bacteria capable of digesting such soluble material and containing soluble sources of manganese, magnesium, phosphorus, iron and nitrogen in a liquid medium at a pH ranging from about 5.5 to 9, the soluble organic material content being in excess of 1 gram per liter;

b. introducing an oxygenating gas into the mixture so as to maintain the dissolved oxygen content at least 0.01 mg per liter of said mixture while

c. maintaining said mixture at a temperature of from 45° to 70°C for a time sufficient to convert the organic waste material into cellular proteinaceous material, and

d. separating the cellular proteinaceous material produced.

3,961,079

ENSILING OF GREEN FODDER WITH HEXAMETHYLENE TETRAMINE AND SODIUM NITRITE

Arvid Emanuel Hellberg, Uppsala, Sweden, assignor to Plate Kofasil Gesellschaft mit beschrankter Haftung, Bonn, Germany

Continuation of Ser. No. 309,151, Nov. 24, 1972, which is a continuation of Ser. No. 99,265, Dec. 17, 1970, which is a continuation of Ser. No. 667,358, Sept. 13, 1967, abandoned. This application Feb. 28, 1974, Ser. No. 446,762

Int. Cl.[2] A23K *3/03*

U.S. Cl. 426—54 **5 Claims**

1. A method of ensiling green fodder, which comprises adding to the green fodder about 0.1 to 1.0% by weight of a dry pulverulent mixture of hexamethylene tetramine and sodium nitrite in a ratio of from 9:1 to 1:3, and allowing the fodder to ferment.

3,961,080

PROCESS FOR AUTOLYSIS OF YEAST

Hiroshi Sugimoto; Hiroyuki Takeuchi, both of Noda, and Tamotsu Yokotsuka, Nagareyama, all of Japan, assignors to Kikkoman Shoyu Co., Ltd., Noda, Japan

Filed Oct. 3, 1973, Ser. No. 403,262

Claims priority, application Japan, Oct. 17, 1972, 47-103868

Int. Cl.[2] A23L *1/28;* **C12C** *11/34*

U.S. Cl. 426—60 **8 Claims**

2. A process for producing a yeast extract food for humans having good flavour, palatability, and no bitterness comprising adding sodium chloride and ethanol to active yeast selected from the group consisting of *Candia utilis, Saccharomyces disastaticus, Saccharomyces fragilis, Mycotorula japonica, Torulopsis xylinus, Debaryomyces hansenii, Debaryomyces kloeckeri, Pichia scolyti* and *Candia guilliermondii* and subjecting the resulting mixture to autolysis, said sodium chloride and ethanol being added in amounts such that the concentrations become about 2–10% (w/v) and about 1–9% (v/v) of the total volume of the autolytic reaction system, respectively, said active yeast and said concentrations of said sodium chloride and ethanol being selected such that the resultant autolysate is suitable for human consumption, palatable, and has no bitterness.

3. A process for producing a yeast extract food for humans having good flavour, palatability, and no bitterness comprising adding sodium chloride and ethanol to active yeast and subjecting the resultant mixture to autolysis, said sodium chloride and ethanol being added in amounts such that their concentrations become about 2–10% (w/v) and about 5–9% (v/v) of the total volume of the autolytic reaction system, respectively, said active yeast and said concentrations of said sodium chloride and ethanol being selected such that the resultant autolysate is suitable for human consumption, palatable, and has no bitterness.

3,961,081

MOLASSES FEED BLOCK FOR ANIMALS AND METHOD OF MAKING SAME

Carl O. McKenzie, 251 Altura Drive, Fullerton, Calif. 92632

Continuation of Ser. No. 259,533, June 5, 1972, which is a continuation-in-part of Ser. No. 850,226, Aug. 14, 1969, abandoned. This application Mar. 12, 1974, Ser. No. 450,410

Int. Cl.[2] C13F *3/00*

U.S. Cl. 426—658 **16 Claims**

1. The method of making generally non-porous, hard, vitreous feed blocks for animals which comprises the steps of providing a fluid feed composition having a molasses content in the range of from about 50% to 100% of the total composition, heating said fluid composition at substantially ambient pressure and without substantial foaming in the composition to a temperature within a range of from about 225°F. to about 300°F. so as to drive off the major portion of the water content of the molasses in the composition, subjecting substantially all portions of said heated, fluid composition to a substantial vacuum without substantial further temperature increase so as to further substantially reduce the water content of the molasses in the composition, forming said composition into blocks of about 20 to 100 pounds weight while it is still sufficiently hot to be formable, and allowing the composition to cool until it hardens into formed blocks.

3,961,082

EDIBLE FOOD CASING PRINTED WITH WATER-RESISTANT INK

Bruno Winkler, Am Hummelberg 9, 6941 Oberflockenbach, Germany

Filed Mar. 7, 1973, Ser. No. 338,710

Claims priority, application Germany, Mar. 15, 1972, 2212398

Int. Cl.[2] A22C *13/00;* **A23L** *1/275*

U.S. Cl. 426—87 **31 Claims**

1. A process for the manufacture of edible collagen food casings bearing a water-resistant printed mark, which comprises printing a dry collagen tube with an edible ink comprising:

a. at least one pigment dyestuff in an amount of 10 to 60% by wt.;

b. at least one liquid suspending medium for the pigment dyestuff selected from the group consisting of water and plasticizer alcohols, in an amount of 30 – 80% by wt.; and

c. at least one substance that is cross-linkable by heating alone or in combination with a tanning treatment selected from the group consisting of proteins, cellulose, cellulose derivatives, pectins, gum arabic and alginates, in an amount of 2 – 30 wt.%;

and thereafter subjecting the printed tube to the condition which causes cross-linking of the cross-linkable substance to render the printed mark water-resistant.

3,961,083

MEAT FLAVORED VEGETABLE PROTEIN PRODUCT

Henry Evans Coleman, Salt Lake City, Utah, assignor to Marian Berkley, Salt Lake City, Utah, a part interest

Filed Oct. 24, 1974, Ser. No. 517,549

Int. Cl.[2] A23L *1/22;* **A23D** *5/00*

U.S. Cl. 426—92 **15 Claims**

1. A textured vegetable protein product having a meat flavor comprising a major amount of hydrated deflavored textured vegetable protein which has been subjected to partial

dehydration and has then had absorbed thereon, as a flavoring material, a minor amount of a rendered animal fat.

12. A process for producing a meat flavored textured vegetable protein product comprising the steps of

a. treating a textured vegetable protein having an average particle diameter of ½ inch or larger by covering said textured vegetable protein with water in a vessel and heating said vessel until the water boils;

b. rinsing the textured vegetable protein from step (*a*) with water;

c. rinsing the textured vegetable protein from step (*b*) with a dilute solution of sodium bicarbonate;

d. partially dehydrating the textured vegetable protein from step (*c*) to remove the loosely held water;

e. comminuting the textured vegetable protein from step (*d*) into smaller sizes; and

f. mixing the textured vegetable protein from step (*e*) with a minor amount of a hot animal fat until the fat is absorbed on the textured vegetable protein.

3,961,084

RICE-TREATING METHOD AND RICE PRODUCTS

James Patrick Cox, and Jeanne Marie Cox, both of Lynden, Wash., assignors to Martin, Robertson & Bain Ltd., Vancouver, Canada

Continuation-in-part of Ser. No. 131,423, April 5, 1971, Pat. No. 3,879,566. This application Oct. 10, 1974, Ser. No. 513,709

Int. Cl.² A23B *9/00*

U.S. Cl. 426—93 **4 Claims**

1. The method of deterring loss of moisture from rice grains and thereby reducing weight loss of the rice during storage which comprises supplying calcium chloride to threshed rice grain prior to storage, for such calcium chloride to be carried by the grains of the rice during storage.

3. A rice product comprising rice grains carrying calcium chloride for deterring escape of moisture from the rice grains which would cause weight loss of the rice during storage.

3,961,085

EDIBLE FOOD CASING DYED WITH AN EDIBLE DYESTUFF AND PROCESS FOR ITS MANUFACTURE

Bruno Winkler, Am Hummelberg 9, 6941 Oberflockenbach, and Dieter Fritz, Konrad-Adenauer-Str. 1, 6940 Weinheim, both of Germany

Continuation of Ser. No. 340,776, March 13, 1973, abandoned. This application Feb. 11, 1975, Ser. No. 549,121

Claims priority, application Germany, Mar. 15, 1972, 2212399

Int. Cl.² A22C *13/00*; A23L *1/275*

U.S. Cl. 426—138 **12 Claims**

1. An unfilled edible food casing suitable for use as a casing for sausage comprising an edible casing material dyed with an, edible dyestuff which is contained in the casing, the dyestuff being encapsulated by a hydrophobic substance selected from the group consisting of edible oils, fats, waxes, and mixtures of these substances, so that the dyestuff is fixed in the casing in a water-resistant manner.

11. A process for the manufacture of a dyed, unfilled, edible food casing which is dyed with a dye in a water resistant manner and is suitable for use as a casing for sausage, comprising encapsulating the dyestuff in finely divided form with a hydrophobic substance to render the dye water resistant, and combining the encapsulated dye with the casing for said dyeing.

3,961,086

PROCESS FOR IMPROVING STORAGE LIFE OF MEAT

Albin F. Turbak, Convent Station, N.J., assignor to Tee-pak, Inc., Chicago, Ill.

Filed Mar. 12, 1974, Ser. No. 450,525

Int. Cl.² A23B *4/14*

U.S. Cl. 426—240 **7 Claims**

1. A process for improving the storage life of fresh meat primal cuts normally subjected to deterioration which comprises the steps:

wrapping said meat primal cuts in a first film which is permeable to a sterilizing agent but impermeable to bacteria, then

diffusing a sterilizing agent inwardly through said first film for killing substantially all of the bacteria on the surface of said meat primal cuts, and then

enclosing said sterilized wrapped meat primal cuts in a second film which is substantially impermeable to oxygen for retarding aerobic bacterial growth.

3,961,087

PROCESS FOR PREPARING COOKED RICE

Harold W. Zukerman, Skokie, Ill., assignor to American Frozen Foods Corporation, Wichita, Kans.

Filed Mar. 28, 1974, Ser. No. 455,606

Int. Cl.² A23L *1/168*

U.S. Cl. 426—262 **12 Claims**

1. A process for preparing a cooked rice product having its grains or particles joined together and having a portion of its amylose and amylopectin modified which comprises:

a. mixing rice grains or particles with water which contains a starch complexing agent wherein the ratio of complexing agent to dry rice is about 1 lb. of complexing agent to about 100 lbs. of dry rice;

b. heating the mixture at about 190°F to about 210°F for a period of time sufficient for the rice grains or particles to absorb from 1 to 4.0 pounds of water per pound of said grains or particles;

c. forming the rice grains or particles into units of a given shape; and

d. heating said units to provide a product having an exterior that is harder than the interior of said product.

3,961,088

METHOD OF PACKAGING FRUIT DRINKS

Roy T. Besand, Manchester; Paul L. Carey, St. Louis, and David J. Armstrong, Oakville, all of Mo., assignors to Ralston Purina Company, St. Louis, Mo.

Filed June 24, 1974, Ser. No. 482,108

Int. Cl.² A23L *2/00*

U.S. Cl. 426—262 **7 Claims**

1. A method of packaging an unbuffered fruit drink which contains an alkali metal bisulfite and residual sulfur dioxide, said method comprising packaging the product at a pH of from about 2.6 to about 3.0 in a substantially gas permeable container having an oxygen barrier of at least 450 cc mils per 100 square inches.

3,961,089

METHOD OF MANUFACTURE OF HOLLOW CHOCOLATE ARTICLES

Amilcare Dogliotti, Neive, Italy, assignor to P. Ferrero & C. S.p.A., Alba, Cuneo, Italy

Filed July 24, 1974, Ser. No. 491,576

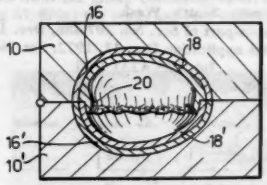
Claims priority, application Italy, July 30, 1973, 69289/73

Int. Cl.² A23G *1/00*

U.S. Cl. 426—274 **2 Claims**

1. A method of manufacturing hollow chocolate articles comprising forming two chocolate shells in complementary mold halves, coating each of said shells on the inside with a molten layer of edible material, cooling the layer in one of said shells to set, inverting the other shell while the layer is still

flowable into complementary mating relation on top of the shell having the set layer therein, allowing the flowable layer



to flow over the edge of the set layer and cooling both shells to set and secure together the overlapping inner layers and thereby hold said shells together.

3,961,090

METHOD OF PREPARING RARE ROAST BEEF

Philip D. Weiner, and Jasper J. Kermans, both of Cincinnati, Ohio, assignors to The E. Kahn's Sons Company, Cincinnati, Ohio

Filed Feb. 28, 1975, Ser. No. 554,159
Int. Cl.² A23L *1/31*
U.S. Cl. 426—281 **12 Claims**

1. A process of preparing rare roast beef which is safe for human consumption comprising the steps of:

a. pumping an aqueous solution of water, salt dextrose, and monosodium glutamate into a 10–15.4 pound piece of uncooked beef;
b. subjecting the pumped beef to deep fat frying to brown and seal the outer surface thereof;
c. placing the beef within an oven-ready bag;
d. producing a vacuum within the bag to cause it to adhere to the outer surface of the beef, and thereafter sealing the bag;
e. cooling the bag-encased beef until it attains an internal temperature of 35°–40°F;
f. placing the cooled, bag-encased beef in a closed chamber and there subjecting it to live-steam-induced temperatures of 162°–165°F until the internal temperature of the beef attains an intermediate temperature of 128°–134°F;
g. discontinuing the addition of heat to said chamber without raising the internal temperature beyond the 128°–134°F range;
h. lowering the temperature of the outer surface of the meat within the bag about 10°F as an intefmediate cooling step;
i. removing the bag-encased meat when, but not before, the internal temperature thereof reaches a final temperature of from 134°–140°F due to the dissipation of residual heat within the bag; and
j. subjecting the bag-encased product to rapid chilling for reducing the internal temperature of the beef from the range of 134°–140°F.

3,961,091

PROCESS FOR PRODUCING FLAVORED POPCORN

John L. Caccavale, 1812 Baxter St.; Victor J. Pierce, 2040 Vestal Ave., both of Los Angeles, Calif. 90026; Robert W. Young, 10 Gracie Square, New York, N.Y. 10028, and Samuel B. Prussin, 2126 Banyan Drive, Los Angeles, Calif. 90049

Continuation-in-part of Ser. No. 369,516, June 13, 1973. This application May 1, 1974, Ser. No. 465,842
Int. Cl.² A23L *1/18*
U.S. Cl. 426—307 **4 Claims**

1. The method of producing flavored popcorn consisting essentially of:

a. combining popcorn kernels, a cooking medium for said popcorn kernels selected from the group consisting of oils, semi-solid fats or solid fats, encapsulated flavoring substances in particulate form and lecithin in an amount sufficient to disperse and prevent agglomeration or clumping of the flavoring substances, but below an amount which will produce excessive foaming and introducing same into a cooking vessel; and,
b. heating said combined materials for a period of time sufficient to pop said popcorn kernels.

3,961,092

METHOD FOR PRESERVING HIGH MOISTURE CONTENT AGRICULTURAL GRAINS

Joseph G. Forest, P.O. Box 367, Waverly, N.Y. 14892, and Edward J. Czarnetzky, P.O. Box 330, Chazy, N.Y. 12921

Continuation-in-part of Ser. No. 466,778, May 3, 1974, abandoned. This application Apr. 3, 1975, Ser. No. 564,818
Int. Cl.² A21D *4/00*
U.S. Cl. 426—331 **1 Claim**

1. A method for preserving high moisture content agricultural grain from bacterial degradation which comprises: applying to said grain, an antibacterial effective amount of a composition consisting essentially of:

1. water,
2. an acid member selected from the group consisting of formic acid, acetic acid, propionic acid, and phosphoric acid, and
3. a synthetic organic cationic or anionic surfactant selected from the group consisting of sodium alkylsulfonethanolamine, ammonium alkylarylpolyethersulfonate, sodium alkylarylpolyethersulfonate, and a sulfonated fatty acid,

whereby said surfactant enhances the penetration of said acid member of (2) into and throughout said high moisture content grain.

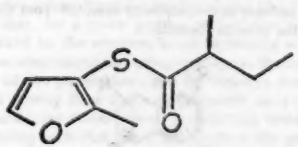
3,961,093

NOVEL FLAVORING COMPOSITIONS AND PRODUCTS CONTAINING 2-METHYL-3-THIO-(2-METHYLBUTYRYL)-FURAN

William J. Evers, Red Bank; Howard H. Heinsohn, Jr., Hazlet; Bernard J. Mayers, Cliffwood Beach, and Elizabeth A. Karoll, Old Bridge, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Continuation-in-part of Ser. No. 478,369, June 11, 1974, Pat. No. 3,917,869, which is a continuation-in-part of Ser. No. 386,451, Aug. 7, 1973, Pat. No. 3,873,731. This application Aug. 12, 1975, Ser. No. 603,934
Int. Cl.² A23L *1/226*
U.S. Cl. 426—535 **2 Claims**

1. A process for altering modifying or enhancing the roasted, nutty or hazelnut flavor of a foodstuff which comprises adding thereto 2-methyl-3-thio-(2-methylbutyryl)-furan having the structure:



in an amount of from 0.1 parts per billion to about 35 parts per million based on the total weight of the foodstuff.

3,961,094

FLAVORING AGENTS COMPRISING UNSATURATED BUTYROLACTONE DERIVATIVES AND PRECURSORS THEREOF

Paul Dietrich, and Erling Sundt, both of Geneva, Switzerland, assignors to Firmenich S.A., Geneva, Switzerland

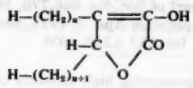
Division of Ser. No. 312,031, Dec. 4, 1972, Pat. No. 3,884,247, which is a division of Ser. No. 115,122, Feb. 12, 1971, abandoned, which is a continuation-in-part of Ser. No. 768,896, Oct. 18, 1968, abandoned. This application Jan. 22, 1975, Ser. No. 543,061

Claims priority, application Switzerland, Oct. 18, 1967, 14559/67; Oct. 12, 1968, 15191/68

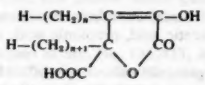
Int. Cl.² A23L *1/226*

U.S. Cl. 426—536 8 Claims

1. A product selected from among heatable and non-heatable foodstuffs, animal feeds and beverages containing at least one compound of the formula



or from heatable foodstuffs, animal feeds and beverages containing at least one compound of the formula



wherein *n* can be 0 or 1, said compound being present in an amount of between 0.1 and 50 parts per million by weight.

3,961,095

FLAVORING AGENT

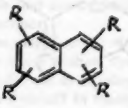
Max Winter, Petit-Lancy; Fritz Gautschi, Commugny; Ivon Flament; Max Stoll, both of Petit-Lancy, all of Switzerland, and Irving M. Goldman, Niantic, Conn., assignors to Firmenich & Cie, Geneva, Switzerland

Division of Ser. No. 243,866, April 13, 1972, abandoned, which is a division of Ser. No. 70,560, Sept. 8, 1970, Pat. No. 3,702,253, which is a continuation of Ser. No. 543,069, April 18, 1966, abandoned, which is a continuation-in-part of Ser. No. 452,342, April 30, 1965, abandoned. This application June 24, 1974, Ser. No. 482,817

Int. Cl.² A23L *1/234*

U.S. Cl. 426—538 68 Claims

52. A process for the modification of the flavor of a composition selected from the group consisting of foodstuffs and beverages which comprises adding thereto a minor, but flavor-modifying amount of a compound selected from those represented by the general formula:



wherein R is hydrogen or methyl or ethyl, at least one of the R's being methyl or ethyl.

3,961,096

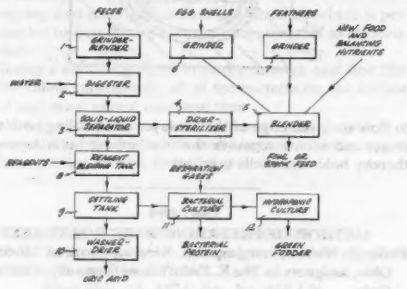
CONSERVATION AND CONVERSION OF POULTRY WASTE PRODUCTS

Mary Victoria Emanuel, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Continuation-in-part of Ser. No. 207,488, Dec. 13, 1971, abandoned. This application Dec. 11, 1972, Ser. No. 313,788

Int. Cl.² A23J *1/00*

U.S. Cl. 426—644 6 Claims



1. The method of producing a composite fowl or stock feed which comprises comminuting poultry feces, mixing aqueous base liquid with the comminuted poultry feces for dissolving from the feces components soluble in such aqueous base liquid, separating the solid phase and the liquid phase of the resulting material, and blending with other food components such solid phase of the material containing food undigested by the poultry.

3,961,097

METHOD OF PREPARING TISSUE FOR MICROSCOPIC EXAMINATION

Joseph F. Gravlee, Jr., 2921 Balmoral Road, Birmingham, Ala. 25223

Filed Oct. 28, 1971, Ser. No. 193,563

Int. Cl.² A01N *1/00;* B05D *3/12*

U.S. Cl. 427—2 6 Claims

1. In a method of preparing a specimen of tissue for microscopic examination including the steps of: immersing a specimen in a bath of dehydrating agent; immersing the dehydrated specimen in a bath of clearing agent; and immersing the cleared specimen in a bath of paraffin, the improvement comprising: the step of applying ultrasonic energy to said specimen during each of said steps, whereby the time required to prepare said specimen is reduced.

3,961,098

COATED ARTICLE AND METHOD AND MATERIAL OF COATING

Irwin I. Bessen, Cincinnati, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Apr. 23, 1973, Ser. No. 353,764

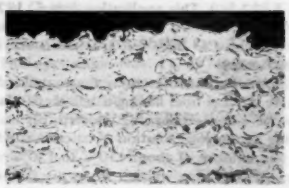
Int. Cl.² C23C *9/00*

U.S. Cl. 427—34 12 Claims

1. In a method for coating a metal surface, the surface based on an element selected from the group consisting of Fe, Co and Ni, the steps of:

impinging on the metal surface a plurality of heated, substantially non-molten MCr-base alloy particles in which the element M is selected from the group consisting of Fe, Co and Ni, the particles deforming, fusing and cooling upon contact with the surface and with other applied particles to deposit on and bond to the surface a fused coating matrix having a matrix outer surface and including voids, lattice vacancies and retained deformation structure;

diffusing into the matrix and into the metal surface through the matrix outer surface a filler metal deposited from a halide vapor produced from a powder including a metal selected from the group consisting of Al and alloys including Al, filling the voids and recrystallizing the matrix



to produce from the matrix a dense, ductile coating layer metallurgically bonded with the metal surface through a diffusion portion, the coating layer having an average aluminum content in the range of about 8–20 weight percent aluminum.

3,961,099

THERMALLY STABLE POSITIVE POLYCARBONATE ELECTRON BEAM RESISTS

Edward Gipstein, Saratoga, Calif.; Wayne M. Moreau, Wappingers Falls, N.Y., and Omar U. Need, III, San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sept. 26, 1974, Ser. No. 509,593
Int. Cl.² B05D *3/06*
U.S. Cl. 427—43 **3 Claims**

1. A process for forming an image with a high resolution radiation sensitive thermally stable positive resist comprising the steps of:

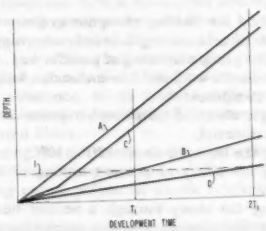
1. forming on a substrate a film comprising a propanebis-4-phenyl polycarbonate,
2. exposing said film in a predetermined pattern to radiation, and
3. removing the radiation exposed position of said film with a solvent.

3,961,100

METHOD FOR DEVELOPING ELECTRON BEAM SENSITIVE RESIST FILMS

David Isaac Harris, Kendall Park, and Loren Bainum Johnston, Princeton, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Sept. 16, 1974, Ser. No. 506,445
Int. Cl.² B05D *3/06*; G03F *1/02*
U.S. Cl. 427—43 **3 Claims**



1. A process for developing a positive light and electron beam-sensitive resist film of a naphthoquinone-(1,2-)diazide sulfonic acid ester admixed with an alkali soluble resin on a support to form a surface relief pattern which consists essentially of the following steps in sequence

a. contacting the unexposed resist film with an aqueous alkaline developer solution,
b. washing the resist film with water,
c. drying the film to remove the water,
d. exposing the film to a modulated electron beam, and
e. contacting the exposed film with the developer solution until the exposed portions of the film are partially dissolved, thereby improving the effective sensitivity of the resist.

3,961,101

PROCESS FOR IMPROVED DEVELOPMENT OF ELECTRON-BEAM-SENSITIVE RESIST FILMS

Lucian Anthony Barton, Trenton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Sept. 16, 1974, Ser. No. 506,444
Int. Cl.² B05D *3/06*; G03F *1/02*
U.S. Cl. 427—43 **2 Claims**

1. A process for developing a supported electron beam sensitive resist film which has been exposed to a modulated electron beam, said resist film comprising an admixture of a naphthoquinone (1,2-)diazide sulfonic acid ester and an alkali soluble resin to form a surface relief pattern which consists essentially of

a. contacting the exposed resist film with an aqueous alkaline developer solution to form only a partially developed relief pattern,
b. washing the partially developed resist film with water,
c. drying to remove the water, and
d. contacting the partially developed and washed resist film with the developer solution for sufficient time to increase the effective sensitivity of said film which thereby improves the resolution of said pattern as compared to a single development step.

3,961,102

SCANNING ELECTRON MICROSCOPE FABRICATION OF OPTICAL GRATINGS

Joseph M. Ballantyne; Chung L. Tang; Lawrence Bryce Rhodes; John J. Turner, and Ji Liang Yang, all of Ithaca, N.Y., assignors to Cornwell Research Foundation, Inc., Ithaca, N.Y.

Filed Sept. 13, 1974, Ser. No. 505,642
Int. Cl.² B05D *3/06*
U.S. Cl. 427—43 **15 Claims**

1. In the method of making optical gratings which includes the steps of (1) providing a structure having a substrate with a film of electron resist material thereon, (2) exposing adjacent areas by electron dosage, and (3) developing the electron resist; the improvement which comprises:

a. determining the electron scattering characteristics of said substrate and said film as an inverse function of their densities, and
b. selecting values for resist thickness and electron dosage such that, for a given grating period, the total energy deposited by the electron beam (including scattered as well as unscattered electrons) will cause the resist in the areas of the grating lines and the resist in the areas between grating lines to react differently to a substantial degree during development, the electron beam penetration being such that when the depth of the groove produced when the resist is exposed and developed is at its maximum dimension, the width of the groove at its maximum dimension is less than one-half of the period of the grating.

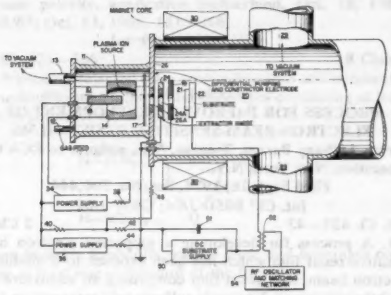
3,961,103
FILM DEPOSITION

Sol Aisenberg, Natick, Mass., assignor to Space Sciences, Inc., Waltham, Mass.

Division of Ser. No. 271,014, July 12, 1972, Pat. No. 3,909,505, which is a continuation of Ser. No. 21,282, March 20, 1970, abandoned. This application Nov. 7, 1974, Ser. No. 521,838

Int. Cl.² C23C 11/00

U.S. Cl. 427—39 **22 Claims**



1. A method for depositing a film on a substrate comprising the steps of:

a. generating an energetic beam of gaseous ions, which may be of the same material as the film to be deposited, by means of a glow discharge ion source;

b. producing a pressure differential between said glow discharge ion source and a deposition chamber containing therein the substrate on which the film is to be deposited together with a source of deposition atoms of the same material as the film to be deposited; and,

c. directing said energetic beam of gaseous ions into said deposition chamber such that the beam of ions impinges concurrently upon the substrate and said source of deposition atoms and thereby deposits a film of the deposition material on the substrate.

3,961,104
INTERNAL CYLINDRICAL BEARING SURFACES

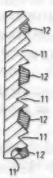
John Ernest Tanner, Dixon St., Wolverhampton, WV2 2BU Staffordshire, England

Filed June 11, 1973, Ser. No. 368,874

Claims priority, application United Kingdom, Oct. 25, 1972, 49150/72

Int. Cl.² B44C 1/08

U.S. Cl. 427—198 **18 Claims**



1. A method of producing a hard wearing swept bearing surface on a machine part that is to run in contact with another machine part without wear, which method consists in utilising a slurry of hard grit screened accurately and in pressing the said slurry into engagement with said surface on a helical path from one end of said surface to the other repetitionally with a pressure such that grooves on criss-cross helical paths are cut out in the surface and particles of the grit are deliberately embedded in the surface.

3,961,105
METHOD FOR THE MANUFACTURE OF COATED CALCIUM SULFATE WHISKER FIBERS

James Joseph Eberl, Moylan; Edmund Thelen, Strafford, and Harold L. Heller, Narberth, all of Pa., assignors to Certain-teed Products Corporation, Valley Forge, Pa.

Continuation-in-part of Ser. No. 238,048, March 27, 1972, Pat. No. 3,822,340. This application July 1, 1974, Ser. No. 484,695

Int. Cl.² B05D 3/02; D02G 3/00

U.S. Cl. 427—220 **9 Claims**

1. The method of manufacturing the coated calcium sulfate hemihydrate whisker fiber having a diameter-to-length ratio of at least about 1 to 6 comprising the steps of:

a. heating an aqueous solution of calcium sulfate dihydrate to a temperature of about 110°C to 150°C until calcium sulfate hemihydrate whisker fibers are formed;

b. recovering said calcium sulfate hemihydrate whisker fibers from said aqueous solution; and

c. applying an inert waterproofing material to said dried calcium sulfate hemihydrate whisker fibers to form a protective coating thereon.

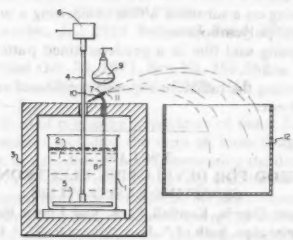
3,961,106
METHOD FOR APPLYING WAX OR PLASTIC COATINGS TO GRANULAR MATERIALS

Herman R. Heytmeijer, Whippany, and Elmer S. Panaccione, North Arlington, both of N.J., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Mar. 3, 1975, Ser. No. 554,834

Int. Cl.² B05D 7/00

U.S. Cl. 427—221 **7 Claims**



1. A method for coating phosphor grains with a molten coating material, said coating material comprising at least one member of the group consisting of paraffin wax, microcrystalline wax, carnauba wax, and low molecular weight polyethylene, which comprises:

a. forming a slurry of the phosphor grains and the molten coating material;

b. heating the slurry to about 120°-130°C;

c. stirring the slurry to prevent settling of the phosphor grains;

d. spraying the slurry through a venturi nozzle whereby droplets are formed of grains encapsulated in coating material:

e. permitting the droplets to solidify during free fall through air;

f. collecting the coated phosphor grains.

3,961,107

FIBER FLEECE CONTAINING A POLYMERIC REINFORCING MATERIAL, AND PROCESS FOR THE PRODUCTION OF SUCH FLEECE

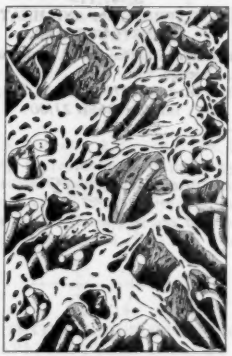
Klaus-Dieter Hammer, Kettelerstrasse 8, 6501 Finthen; Herbert Porrmann, Imkerweg 10, 6272 Niedernhausen, and Ludwig Klenk, Am Rebhang, Jungfernweg 10, 6229 Hallgarten, all of Germany

Continuation of Ser. No. 312,686, Dec. 6, 1972, abandoned, which is a division of Ser. No. 192,899, Oct. 27, 1971, Pat. No. 3,811,923. This application Nov. 11, 1974, Ser. No. 522,743

Claims priority, application Germany, Oct. 30, 1970, 2053497; Oct. 30, 1970, 2053442

Int. Cl.² D06M *1/00*; B05D *5/00*, *3/02*

U.S. Cl. 427—246 23 Claims



1. A process for the production of a reinforced fiber fleece, comprising:

a. impregnating a non-woven fiber fleece with an impregnating liquid containing a synthetic coating substance, capable of forming a wash-proof union with the surfaces of said fibers, in an amount sufficient to coat said fibers, and an organic, non-elastic swelling agent, capable of swelling said fibers, in an amount sufficient to swell said fibers,

b. rinsing the impregnated fibers to remove excess impregnating liquid,

c. drying the rinsed, impregnated fibers for a period sufficient to evaporate that portion of the volatile components of said impregnating liquid within the pores between the coated fibers and form a wash-proof coating of said synthetic coating substance on said fibers,

d. submerging the coated fibers in a liquid solution of an organic, polymeric elastic reinforcing material, having substantially no cohesion to said coating of said synthetic coating substance, in an amount sufficient to form a coherent structure essentially filling the pores between said coated fibers,

e. coagulating said polymeric elastic reinforcing material to form a coherent, impregnated, reinforced fiber fleece,

f. removing excess polymeric elastic reinforcing material, and

g. heating said impregnated, reinforced fiber fleece at a temperature and for a period sufficient to evaporate the remainder of said volatile components of said impregnating liquid and substantially completely de-swell said impregnated fibers.

3,961,108

METHOD FOR TREATING SURFACES OF WOOD PANELS

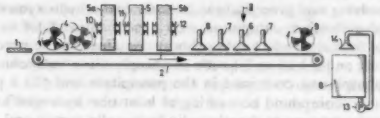
Wolfgang Rosner, Hosefsburgstrasse 73a, 8000 Munich 80, and Georg Drose, Hauptstrasse 29, 8136 Percha, both of Germany

Filed Mar. 11, 1974, Ser. No. 449,653

Claims priority, application Germany, Dec. 13, 1973, 2362028

Int. Cl.² B05D *3/00*, *3/12*

U.S. Cl. 427—275 9 Claims



1. A method for treating a surface of a wood panel in which the panel surface is treated with brushes to develop a relief and subsequently is stained comprising: brushing the panel surface by means of first brush means rotating about a generally horizontal axis extending substantially transverse to the longitudinal extension of the panel to develop a relief in the longitudinal direction of the panel surface, then brushing the panel surface by second brush means rotating about an axis extending in a direction generally perpendicular to the direction of extension of the first mentioned axis, to apply relief producing brushing generally transverse of said longitudinal extension of the panel, then flooding the panel surface with liquid stain and brushing wax into the panel surface whereby said panel surface is smoothed.

3,961,109

SENSITIZERS AND PROCESS FOR ELECTROLESS METAL DEPOSITION

Richard K. Kremer, Glen Oaks, and Rudolph J. Zeblisky, Hauppauge, both of N.Y., assignors to Photocircuits Division of Kollmorgen Corporation, Glen Cove, N.Y.

Continuation-in-part of Ser. No. 384,691, Aug. 1, 1973, abandoned. This application July 11, 1974, Ser. No. 487,738

Int. Cl.² C23C *3/02*

U.S. Cl. 427—304 24 Claims

1. A clear solution for sensitizing a surface to the deposition of adherent electroless metal, said solution consisting essentially of a liquid medium and the reaction product of admixing and heating A, D, E and G, wherein:

A is an ion of a precious metal selected from those of the fifth and sixth periods of Groups VIII and IB of the Periodic Table of Elements:

D is an ion of a Group IV metal of the Periodic Table of Elements which is capable of two valence states;

E is an anion capable of forming a stable complex with components A and D; and

G is a hydroxyl group-containing aromatic organic compound capable of forming a stable, soluble complex with the precious metal ion A or the Group IV metal ion D;

said admixing comprising the steps:

1. forming a first solution comprising A and E and a second solution comprising D and E, with at least one of said solutions also comprising G; and

2. adding said first solution to said second solution.

3,961,110

TREATMENT OF ORGANIC TEXTILES WITH ADDUCT POLYMERS AND PHENOLS

Donald J. Daigle, New Orleans; Armand B. Pepperman, Jr., Metairie, and Sidney L. Vail, River Ridge, all of La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Aug. 22, 1974, Ser. No. 499,806
Int. Cl.² C09D 5/18; C09K 3/28
U.S. Cl. 427—390 **2 Claims**

1. A process for preparing flame resistant organic textiles, comprising:

wetting an organic textile with a solution comprising (1) an adduct polymer prepared by,

reacting a hydroxymethylphosphorus compound with a nitrogenous compound to form an insoluble polymeric precipitate, and

dissolving said precipitate in formalin and a hydroxymethylphosphonium compound with a mole ratio of 1:4 to 4:1 of formaldehyde to phosphorus contained in the precipitate and a 1:10 to 2:1 ratio of phosphonium compound to phosphorus contained in the precipitate and (2) a phenolic compound containing at least one hydrogen atom ortho or para to the phenolic hydroxylic group; and

drying and heating the treated textile at a temperature of from 90° to 170°C. until the adduct polymer and phenolic compound have reacted.

3,961,111

METHOD OF INCREASING CORROSION RESISTANCE OF ANODIZED ALUMINUM

Harold Vernon Smith, deceased, late of Philadelphia, Pa. (by Jean E. Smith, administrator), assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Mar. 18, 1975, Ser. No. 559,614
Int. Cl.² C25D 11/18
U.S. Cl. 427—419 **3 Claims**

1. The process for sealing anodized aluminum comprising contacting the anodized aluminum with deionized or distilled water containing at least 0.001% by weight of one or more sealing additives selected from the group consisting of

(N-methyl-N-(3-dimethylaminopropyl)-n-perfluorooctylsulfonamide) methylammonium iodide, and

(N-ethyl-n-perfluorooctylsulfonamido tridecaethyleneoxy)ethanol

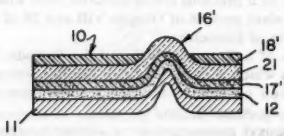
for a period of time ranging from ten minutes to 1 hour and at a temperature within the range of about 160° to 212°F. and thereafter drying the sealed aluminum.

3,961,112

LUMINOUS EMBOSSABLE TAPE

Roberta L. Genevitz; Joseph R. Genevitz, both of 2613 Chinchilla Drive, Wilmington, Del. 19810, and John B. Sowell, 182 Midfield Road, Ardmore, Pa. 19003

Filed Aug. 2, 1974, Ser. No. 494,351
Int. Cl.² B44F 1/10
U.S. Cl. 428—29 **11 Claims**



1. An embossable tape comprising:

an embossable base layer of rigid synthetic organic resin embossable material having a front and a rear face, said material having a structure and composition which takes a permanent flow deformation upon being embossed,

a luminous layer comprising luminous material parallel to and supported by said embossable layer and which takes the shape of said embossable base layer upon being embossed, whereby

said tape is embossable to provide light emitting areas and light absorbing areas defining luminous indicia on the front face of said tape.

3. An embossable tape as set forth in claim 2 which further comprises a strippable backing layer selected from the group consisting of paper, cardboard or plastic attached to said adhesive layer.

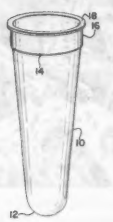
7. An embossable tape as set forth in claim 1 which further comprises a plasticizer layer supported on the front face of said embossable base layer, said plasticizer layer comprising an elastic material selected from the group consisting of natural rubber or synthetic material which ruptures and exposes the raised embossments in said tape.

3,961,113

THERMOPLASTIC PREFORM AND HEATED MANDREL CONSTRUCTIONS

Leslie Stephan Marco, Des Plaines, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Mar. 3, 1975, Ser. No. 554,992
Int. Cl.² B65D 21/00
U.S. Cl. 428—35 **5 Claims**



1. A plastic preform for application to a complementally shaped smooth surfaced heated mandrel of the type used in plastic molding machines for reshaping the preform under heat and applied differential pressure; and comprising a body portion of generally conical configuration from an open upper end to a closed smaller end and with a major smooth interior surface from the closed end to an area adjacent the open end, said area having internal spaced surface portions providing passages therealong for upward withdrawal of air from between the mandrel surface and the smooth interior surface of the preform body portion for uniform conformation of the smooth interior surface of the preform to the mandrel surface, and said preform body portion having an internal surface portion around the open end and close to the passaged area for contacting an adjacent remnant surface of the mandrel with permissive relative sliding movement therebetween under continued application of heat and differential pressure without reactive tendency for the major portion of the body portion to separate from the mandrel surface.

3,961,114

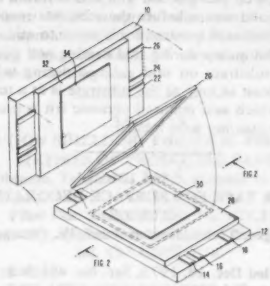
GLASS COMPOSITION

Melvin Berkenblit, Yorktown Heights; Robert O. Lussow, Hopewell Junction, and Arnold Reisman, Yorktown Heights, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 353,026, April 20, 1973. This application Aug. 7, 1974, Ser. No. 495,352
Int. Cl.² B32B 9/00; B44C 5/08; B06B 3/24
U.S. Cl. 428—38 **1 Claim**

1. In a structure comprising a plurality of conductive lines supported on a dielectric glass substrate, a layer of admixed

glass covering said conductive lines and supported by said substrate wherein said admixed glass is a composition G consisting of a first composition A composed of 14.1%, SiO_2, 72.8% PbO, 12.5% B_2O_3, 0.2% Al_2O_3, 0.1% CaO, 0.2% Na_2O, and 0.1% MgO and a second composition B composed of 71.11% SiO_2, 2.38% Al_2O_3, 7.13% CaO, 14.45% Na_2O, 3.76%



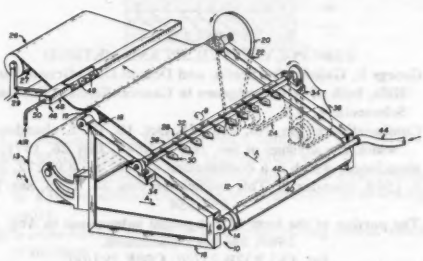
MgO, 0.30% of K_2O, 0.13% B_2O_3, and 0.74% Pbo with said percentages being approximate percentages by weight and with the composition G being determined according to the relationship $G = F(A) + (1-F)B$, where G is the whole composition and F is the fractional part less than one by weight that Glass A is of G and A and B are said first and second compositions.

3,961,115

METHOD FOR TEXTURIZING FLOCKED FABRIC AND FABRIC PRODUCED THEREBY

Charles Klein, Mexico City, Mexico, assignor to United Merchants and Manufacturers, Inc., New York, N.Y.

Filed Oct. 24, 1972, Ser. No. 299,910
Int. Cl.² D06C *23/00*
U.S. Cl. 428—88 **6 Claims**



1. A continuous method for texturizing a flocked fabric comprising:

a. continuously feeding said flocked fabric from a source of supply, such that, the flocked fabric lies in a single plane;
b. wetting the flocked portion of the moving fabric with a liquid;
c. orienting the wet flock in a predetermined design pattern by continuously and rapidly contacting the flocked side of the moving planar fabric in a whip like manner with a plurality of flexible beaters having preselected shapes; and then
d. drying the moving fabric to set said flock in said predetermined design pattern.

6. A texturized flocked fabric obtained by the process of claim **1.**

3,961,116

NOVEL FLOCKED FABRIC

Charles Klein, Mexico City, Mexico, assignor to United Merchants and Manufacturers, Inc., New York, N.Y.

Continuation of Ser. No. 351,096, April 13, 1973, Pat. No. 3,903,331
This application May 27, 1975, Ser. No. 581,252
Int. Cl.² B05D *1/14, 1/16;* **B32B** *33/00*
U.S. Cl. 428—90 **2 Claims**

1. An air permeable flock fabric comprising:

a. a backing layer of a loosely interlaced fabric having a non-continuous, permeable coating of an adhesive binder thereon which permeates the spaces therein;
b. a substantially continuous top layer of upstanding flock fibers secured to the fabric by said binder; and
c. a substantially continuous bottom layer of flock fibers secured to said backing layer by said binder

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3,961,117

ANTISTATIC CARPET AND METHOD FOR MANUFACTURING SAME

Agis F. Kydonieus, Kendall Park, and Inja Smith, Montclair, both of N.J., assignors to Herculite Protective Fabrics Corporation, New York, N.Y.

Filed Nov. 21, 1973, Ser. No. 417,833
Int. Cl.² D03D *27/00;* **D04H** *11/00;* **D05C** *17/00*
U.S. Cl. 428—96 **10 Claims**

1. A carpet exhibiting antistatic properties comprising

a primary carpet backing,

carpet fibers, the bases of which are locked in said primary backing, said fibers being selected from the group consisting of wool, acrylic, nylon, polyester, and lower polyolefin fibers, and

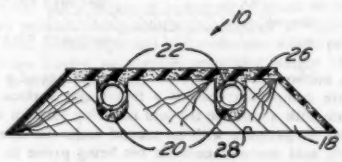
a coating of polymeric composition on the surface of said primary backing opposite the carpet pile, but in contact with the bases of said fibers, said coating containing an antistatic agent which is present in an amount of at least about four ounces per square yard of carpet surface area, and is capable of migrating into and throughout the length of said carpet fibers to render the fibers themselves antistatic to the extent that static buildup is maintained below 3,000 volts.

3,961,118

SIMULATED WOOD PANEL

David E. Michaelis, Warminster, Pa., assignor to Plastics Development Corporation of America, Philadelphia, Pa.

Division of Ser. No. 291,100, Sept. 21, 1972, Pat. No. 3,896,199. This application May 7, 1975, Ser. No. 575,330
Int. Cl.² B32B *3/00, 3/20*
U.S. Cl. 428—151 **7 Claims**



1. A simulated wood panel which resists warpage and bending comprising a substrate formed of a water absorbing fibrous material, said substrate having at least one elongated groove on one surface thereof, a rigid elongated reinforcing means in

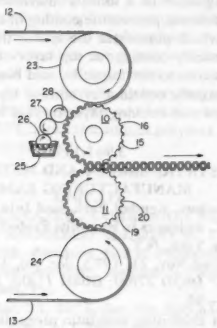
said groove, a foamed polymer covering said surface of said substrate and anchoring said rigid elongated reinforcing means to said substrate, said polymer at least substantially surrounding said elongated reinforcing means and sealing said substrate against moisture, the outside surface of said foamed polymer having a simulated wood grain finish thereon.

3,961,119

EMBOSSED PAPER TOWELING AND METHOD OF PRODUCTION

Gordon D. Thomas, Neenah, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Division of Ser. No. 341,464, March 15, 1973, Pat. No. 3,868,205. This application Aug. 15, 1974, Ser. No. 497,578
Int. Cl.² B32B 3/12
U.S. Cl. 428—178 5 Claims



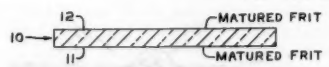
1. A multi-ply absorbent paper sheet comprising embossed, opposed, creped outer webs each having a series of laterally extending continuous ribs and grooves, said ribs of each web projecting toward and crossing ribs of the other web and each rib bridging grooves of the other web, adhesive securing the ribs of one web to ribs of the other web, said adhesive being disposed in a pattern consisting of individual adhesive zones and constituting about 10% to about 50% of the rib surface area of one of the webs, said ribs and grooves being otherwise substantially free of adhesive and said adhesive zones being defined by slight recesses in the ribs which break up the continuity of the ribs providing a patterned appearance.

3,961,120

COATING GLASS SHEETS ON BOTH SURFACES

Ralph E. Hearn, and Clarence McMillen, both of Galion, Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Feb. 13, 1974, Ser. No. 442,285
Int. Cl.² B32B 9/00, 17/06
U.S. Cl. 428—210 12 Claims



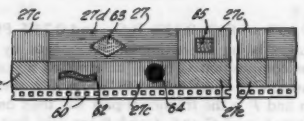
1. A method of coating both major surfaces of a ceramic substrate comprising coating a first major surface of said substrate with a ceramic frit and maturing said frit at a first elevated temperature with its second major surface free of said frit, said matured ceramic frit being prone to damage when contacted with a solid means at an elevated temperature approaching its maturing temperature, orienting said substrate so that its first major surface faces downward and said second major surface faces upward, applying ceramic frit to the second major surface of said substrate at a temperature below which said matured ceramic frit would be prone to said damage while said substrate is so oriented, subjecting said substrate to a thermal treatment that comprises heating said substrate while so oriented to a temperature above said first elevated temperature and cooling said substrate to below a temperature at which said frit hardens and fuses to said second major surface, and initiating the application of a bed of gas against said matured frit coating to support said substrate in said orientation on said gas bed with said matured frit coating spaced from solid means before the substrate reaches a temperature at which said matured frit is prone to said damage on contacting solid means during said heating and continuing to support said substrate on said gas bed during said thermal treatment at least as long as the substrate is at a temperature at or above which said matured ceramic frit is prone to said damage on contacting solid means.

3,961,121

TRANSFER TAPE FOR SURFACE DECORATING AN ARTICLE

Rubin Warsager, 72 Luddington Road, W. Orange, Newark, N.J. 07052

Filed Dec. 14, 1973, Ser. No. 424,869
Int. Cl.² B32B 3/18, 7/06; C09J 7/02
U.S. Cl. 428—200 8 Claims



1. A transfer tape for use in decorating the surface of articles with a design, comprising a base, a heat release material applied to said base, at least two sequentially arranged color zones transversely dividing said tape and applied to said heat release material so that said color zones do not include said design which is to be applied to said article, said color zones comprising pigment, each of said color zones including only a single pigment layer, whereby upon the application of a die to said color zones the characteristics of said die determine the characteristics of said design to be imparted to said articles, and an adhesive coating.

3,961,122

THIN POLYMER FILMS AND METHOD

George L. Gaines, Jr., Scotia, and Donald G. LeGrand, Burnt Hills, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 298,471, Oct. 18, 1972, abandoned, which is a division of Ser. No. 164,847, July 26, 1971, abandoned, which is a continuation of Ser. No. 839,272, July 7, 1969, abandoned. This application Feb. 24, 1975, Ser. No. 552,554
The portion of the term of this patent subsequent to Aug. 22, 1989, has been disclaimed.
Int. Cl.² B32B 25/20; C08F 293/00
U.S. Cl. 428—220 6 Claims

1. A continuous, stable, substantially uniform, self-supporting polymer film having smooth surfaces and a thickness of less than 50 microns, said film consisting essentially of a synthetic aromatic base homopolymer and a synthetic surface-active block copolymer additive compatible therewith, said additive ranging in amount from 0.1 to 99% by weight of said base homopolymer, said additive consisting essentially of substantially uniform repeating blocks of a first polymerized aromatic comonomer and a second polymerized organosiloxane comonomer, said first polymerized aromatic comonomer being characterized by an average block length of at least three monomer units and being compatible and substantially miscible with said base homopolymer to substantially stabilize said block copolymer therein, said second polymerized como-

nomer being characterized by an average block length of at least five monomer units and a surface activity sufficient to depress the surface tension of a solution of said base homopolymer to at least about 24.7 dynes/cm. or lower, said polymer film being produced by dissolving said aromatic base homopolymer and said block copolymer additive in a solvent to form a solution having a surface tension of about 24.7 dynes/cm. or lower, contacting the resulting solution with film-forming means which supports said solution to allow said solvent to evaporate without impairing the smooth surfaces of the resulting film, allowing said solvent to evaporate and recovering the resulting film.

3,961,123

RADIATION SHIELDING PHENOLIC FIBERS AND METHOD OF PRODUCING SAME

Koichiro Ohtomo, Takatsuki, Japan, assignor to Kanebo, Ltd., Tokyo, Japan

Filed Dec. 26, 1973, Ser. No. 428,127
Claims priority, application Japan, Dec. 29, 1972, 48-2322
Int. Cl.² C08G *8/18*
U.S. Cl. 428—224 **11 Claims**

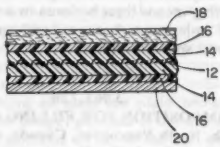
1. A radiation shielding phenolic fiber comprising (A) a filamentary phenolic polymer consisting predominantly of a sulfonic acid group-containing cured novolak resin wherein said novolak resin contains 0.1–4.0 meq/g-fiber of the sulfonic acid group and is cured to a curing degree of 5–30% and (B) 0.1-3.5 meq/g-fiber of a metallic atom having a great radiation shielding capacity, said metallic atom having an atomic number of at least 13 and being incorporated in said polymer by being chemically bound in the ionic state in said novolak resin.

3,961,124

SHOE-STIFFENER MATERIAL OF LATEX SATURATED FLEXIBLE FABRIC

George Matton, 528 Broadway, Lowell, Mass. 01854

Filed Nov. 4, 1974, Ser. No. 520,725
Int. Cl.² B32B *25/04*
U.S. Cl. 428—250 **12 Claims**



1. A shoe-stiffening material which comprises an absorbent fibrous flexible sheet material impregnated with:

a. a natural or synthetic elastomer subject to cross-linking to a thermosetting condition by a peroxide cross-linking agent;

b. a cross-linking amount of a peroxide-curing system which comprises

i. a peroxide cross-linking agent having an activation temperature of above 150°C, and which has no toxic residue products on activation,

ii. a metal oxide selected from the group consisting of sodium oxide, potassium oxide, barium oxide, calcium oxide and magnesium oxide in an amount of from 0.01 to 1.0 phr to lower the activation temperature of the peroxide to below 150°C and more than 70°C, and

iii. a thermoplastic vinyl polymer is an amount of from 0.001 to 0.1 phr to promote the efficiency of the peroxide on activation; and

c. the material being soft, limp, ductile and flexible, but which material is converted on heating to a stiff and resilient material in a shoe mold having a temperature of from about 135° to 150°C for a period of time for about 5 to 30 seconds.

12. A shoe-stiffening material which comprises:

a. an absorbent woven cotton sheet material having a moisture level of less than about 10% and impregnated with an amount of from about 20 to 50% by weight of a styrene butadiene peroxide cross-linkable elastomer which contains a cross-linking amount of a peroxide-curing system which comprises:

i. from about 0.5 to 10 parts per hundred parts of elastomer of dicumyl peroxide,

ii. from about 0.01 to 1.0 phr of calcium oxide, and

iii. from about 0.01 to 0.1 phr of polyvinyl acetate or ethylene vinyl acetate,

b. the cotton sheet material having on one or both surfaces a thermoplastic adhesive layer which comprises polyvinyl acetate, ethylene vinyl acetate, hydrocarbon resin and wax or combinations thereof; and

c. the material being soft, limp, ductile and flexible, but which material is converted on heating to a stiff and resilient material when heated in a shoe mold having a temperature of from about 135° to 150°C for a period of time for about 5 to 30 seconds.

3,961,125

TEMPORARY INTERLINING COATED WITH FOAMED ADHESIVE

Toshihiko Suminokura; Yojuro Kyogoku, and Noboru Yasumoto, all of Neyagawa, Japan, assignors to Kurashiki Boseki Kabushiki Kaisha, Japan

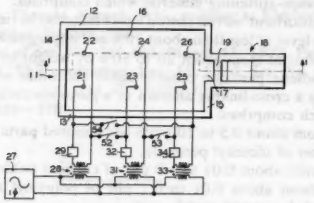
Continuation-in-part of Ser. No. 315,830, Dec. 18, 1972, which is a continuation of Ser. No. 70,542, Sept. 18, 1970, which is a continuation of Ser. No. 692,134, Dec. 20, 1967.
This application Feb. 28, 1975, Ser. No. 554,328
Int. Cl.² B44D *1/44*
U.S. Cl. 428—261 **7 Claims**

1. In an interlining of temporary adhesiveness comprising a fabric base material and a dry layer of an adhesive thereon, the improvement which comprises using said adhesive in the form of a foam having a viscosity of from about 10,000 to about 200,000 c.p.s. as measured at 50°C., providing a continuous coating layer of said foam on one surface of the fabric base material, and drying said continuous coating layer, said adhesive being soluble in water and sticky on moistening and being a member or a combination of members selected from the group consisting of water-soluble cellulose derivatives, water-soluble starch derivatives, water-soluble natural gums, water-soluble alginic acid derivatives, water-soluble acrylic polymers having an intrinsic viscosity of about 0.1 to about 2.0, polyvinyl alcohol or partially hydrolyzed polyvinyl acetate having an average degree of polymerization of about 300 to about 3,000 and a degree of hydrolysis of about 60 to about 100 mol percent, water-soluble copolymers of styrene and maleic acid, gelatin, agar and high molecular weight polyethylene oxides having an average molecular weight of about 30,000 to about 2,000,000.

3,961,126
APPARATUS AND METHOD FOR INCREASING ELECTRIC POWER IN AN ELECTRIC GLASS-MELTING FURNACE

John F. Maddux, Heath, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Continuation-in-part of Ser. No. 475,674, June 3, 1974, abandoned. This application Feb. 24, 1975, Ser. No. 552,083
Int. Cl.² C03B 5/02
U.S. Cl. 13—6 **25 Claims**



1. A system for heating molten glass by the Joule effect, comprising:

a chamber for containing glass constituents;

a first group of electrodes within said chamber;

means applying an alternating voltage across said first group of electrodes;

a second group of electrodes within said chamber;

means applying an alternating voltage across said second group of electrodes, whereby instantaneous voltage differences exist between certain electrodes of said second group and certain electrodes of said first groups; and

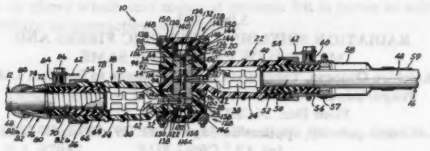
means for concentrating an increase of electrical power dissipation in a path between at least one of said certain electrodes of each of said first and second groups by selectively connecting a low impedance current path between an other certain electrode of said first group and an other certain electrode of said second group which is at a different instantaneous voltage than said electrode of said first group a preponderance of the time alternating voltage is applied across said first and second electrode groups during those periods said low impedance current path is disconnected, whereby the algebraic sum of the instantaneous voltage applied across said first group and the instantaneous voltage applied across said second group is imposed across said path and the voltage difference across said glass between said other certain electrodes during those periods said low impedance current path is disconnected is effectively imposed across said path by said connecting means.

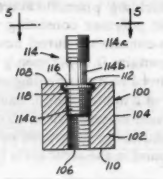
3,961,127
UNIVERSAL POWER CABLE JOINT FOR USE WITH POWER CABLES HAVING VARIOUS INSULATIONS

Robert B. Gear, Jr., Hinsdale, Ill., and John C. Masepohl, Munster, Ind., assignors to G & W Electric Specialty Company, Blue Island, Ill.

Filed June 11, 1975, Ser. No. 586,067
Int. Cl.² H02G 15/08, 15/24
U.S. Cl. 174—22 R **14 Claims**

1. A cable joining device for connecting the ends of a plurality of power cables at least one of which may comprise an impregnated insulation type power cable, comprising, in combination, a spade terminal adapted to be secured on a bared conductor end of each of said power cables, each of said spade terminals having a transverse bore therethrough, a tubular splice housing adapted for cooperation with each of said spade terminals, each tubular splice housing having a transverse bore therethrough and being adapted to receive its associated spade terminal therein in a manner to expose the transverse bore of said spade terminal through said transverse bore in said splice housing, an electrically conductive spacer block having opposite end surfaces receivable within the transverse bores of two splice housings positioned in adjacent relation with their said transverse bores in substantially axial alignment, means securing the exposed spade terminals within said axially aligned bores to said end surfaces of said spacer block in electrical conducting relation therewith, said securing means including a stud shaft sealingly secured within a longitudinal bore formed in said spacer block so as to extend substantially axially from one end surface thereof for receipt through the exposed transverse bore in the spade terminal within one of said adjacent splice housings, said securing means further including connector means mountable on the outer end of said stud shaft so as to secure said spade terminal against said one end surface of said spacer block, seal means disposed between said adjacent splice housings and sealingly engaging the periphery of said spacer block, and means for securing said adjacent splice housings in said adjacent relation with said sealing means therebetween in a manner to prevent migration of impregnate between said splice housings and their associated spade terminals.

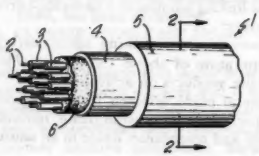




3,961,128
COMPOSITION FOR FILLING CABLES

Shirley Beach, North Vancouver, Canada, assignor to Phillips Cables Limited, Brockville, Canada

Filed Dec. 27, 1973, Ser. No. 428,757
Claims priority, application Canada, Dec. 29, 1972, 160290
Int. Cl.² H02G 15/20
U.S. Cl. 174—23 C **21 Claims**



1. A communication cable comprising a plurality of conductors enclosed within a sheath; interstices between individual conductors and between the conductors and the sheath being filled with a composition comprising petroleum jelly and sili-

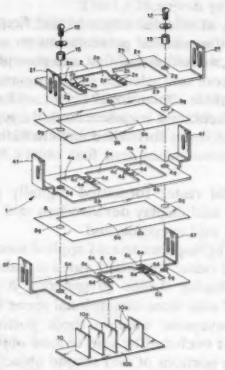
ceous material in an amount effective to render the petroleum jelly viscous at elevated temperatures, the siliceous material having a relatively large surface area to mass ratio and being substantially uniformly distributed throughout the petroleum jelly.

3,961,129

ELECTRICAL BUSSING AND JUMPER ASSEMBLY

Donald F. Gehrs, Affton, and David T. Higgins, Imperial, both of Mo., assignors to Zinsco Electrical Products, St. Louis, Mo.

Filed Dec. 11, 1975, Ser. No. 639,655
Int. Cl.² H02B *1/20*; H02G *5/00*
U.S. Cl. 174—72 B **14 Claims**



1. An electrical bussing and jumper assembly for use with electrical switching devices, said assembly comprising:

a plurality of bus plates stacked together in a sandwich-like array, said bus plates having openings therein defining pairs of side portions and defining a plurality of jumper portions between the openings and bridging the side portions for connection with electrical switching devices, the jumper portions of each bus plate being staggered with respect to the jumper portions of the other bus plates and the jumper portions of all of the bus plates being spaced from each other in a ladder-like fashion in the sandwich-like array, said jumper portions being of different physical configurations;

insulation means electrically insulating the bus plates from each other; and

electrical connection means connected to the plurality of bus plates for establishing electrical current paths through said bus plates to the jumper portions of the bus plates.

3,961,130

MEMORY DIAL FOR TELETYPEWRITER SUBSCRIBERS

Pedro Brown, Jr., San Jose, Calif., assignor to RCA Corporation, New York, N.Y.

Filed June 10, 1971, Ser. No. 151,802
Int. Cl.² H04L *15/00*
U.S. Cl. 178—2 E **4 Claims**

1. In a switching system for a plurality of teletypewriter stations, a switching exchange, and a plurality of communication paths extending from said exchange to said stations, the combination comprising:

a. control means responsive to calling information establishing connections from one of said stations through said switching exchange to selected ones of said paths to another station corresponding to the calling information;

b. a plurality of manually operable key means for generating calling information;

c. said manually operable key means being located at each of said stations;

d. electrical circuit means for encoding the calling information produced by said manually operable key means to a desired code form;

e. electrical circuit memory means for storing the coded form of the calling information;

f. electrical circuit means responsive to the operation of said key means for processing the data stored in said memory to said exchange and electrical circuit means for retaining said data in said memory until new calling information is generated by said manually operable key means; and

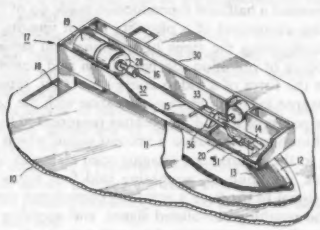
g. manually operable electrical circuit means including a repertory key for processing said stored data from said memory to one of said paths automatically with the operation only of said repertory key.

3,961,131

DISC RECORD LOCKED GROOVE ESCAPE APPARATUS

Byron Kent Taylor, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 27, 1975, Ser. No. 562,730
Claims priority, application United Kingdom, Feb. 28, 1975, 8405/75
Int. Cl.² H04N *5/76*; G11B *3/10*, *3/38*, *17/00*
U.S. Cl. 178—6.6 R **5 Claims**



1. In a system for playing back prerecorded signals from a spirally grooved disc record by a groove-engaging signal pickup secured to a pickup arm when relative speed is established therebetween, the playback system including a base; a locked groove skipper comprising:

a carriage mounted on the base for movement between a playback mode and a standby mode;

means for driving the carriage radially inward in synchronization with rotation of the disc record during playback independent of radial motion of the signal pickup due to the spiral groove;

means for pivotally supporting the pickup arm in the carriage;

means for lowering the pickup arm in order to effect the engagement of the signal pickup with the spiral groove of the disc record for playback; and

a steering member secured to the carriage adjacent the pickup arm such that the steering member and the disc record center are on the opposite sides of the pickup arm, wherein the location of the steering member relative to the lowered position of the pickup arm is such that a minimum clearance is developed between the steering member and the pickup arm upon initial lowering of the pickup arm for playback due to the disc record lateral eccentricity; and such that when the signal pickup encounters a locked groove, the advancing steering member engages the pickup arm to effect radially inward move-

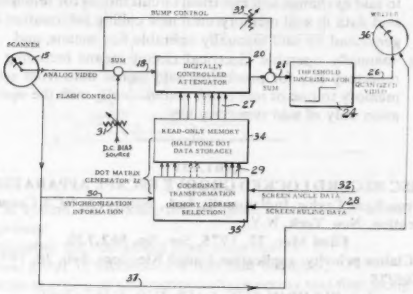
ment thereof, whereby the signal pickup is relieved from the locked groove.

3,961,132

SEQUENTIAL IMAGE-MODULATED DOT-AREA RECORDING

Robert M. Landsman, Norwalk, Conn., assignor to Log Etronics Inc., Springfield, Va.

Filed July 15, 1974, Ser. No. 488,389
Int. Cl.² H04N 1/40, 5/84, 3/00
U.S. Cl. 178—6.7 R **12 Claims**



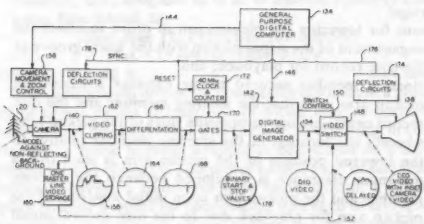
1. A method of producing from original continuous tone subject-matter a halftone reproduction made up of dots which in turn are composed of a plurality of dot imaging scan elements, comprising the steps of scanning said subject-matter with a beam of radiation, deriving from said scanning a first signal in the form of a video energy function, repeatedly selecting stored information in accordance with the coordinates of image points of the subject-matter represented by the video energy function to produce a second signal which varies according to the desired dot imaging scan elements of the halftone dots, continuously weighting said first signal with said second signal to produce a resulting convoluted signal, quantizing the resulting colvoluted signal, and applying the quantized signal, in a synchronized scanning mode, to produce the halftone reproduction made up of dots that are comprised of dot imaging scan elements, said scanning proceeding at a rate sufficiently in excess of the desired halftone screen rate to enable production of the aforesaid halftone reproduction.

3,961,133

METHOD AND APPARATUS FOR COMBINING VIDEO IMAGES WITH PROPER OCCLUSION

William S. Bennett, Chenango Bridge, N.Y., assignor to The Singer Company, New York, N.Y.

Filed May 24, 1974, Ser. No. 472,971
Int. Cl.² H04N 7/18
U.S. Cl. 178—6.8 **12 Claims**



1. A method of producing a composite image on a display device from a combination of digitally generated video signals representative of selected objects and camera generated video signals representative of other selected objects not suitable for digital generation, said composite image providing a two-dimensional presentation of a three-dimensional scene as seen from a selectively variable eyepoint, said method comprising the steps of:

providing raster formatted camera generated video signals representative of a two-dimensional presentation of an assumed image plane of a first object not suitable for digital generation included in said three-dimensional scene as viewed from a selected eyepoint;

providing raster formatted digitally generated video signals representative of a two-dimensional presentation on said assumed image plane of a second object included in said three-dimensional scene as viewed from said selected eyepoint;

synchronizing said camera and digitally generated raster formatted video signals with the generation of raster lines on a display device;

determining, at selected edges of said first and second objects two-dimensional presentation on said assumed image plane, which of said first and second objects pierced by a ray from said selected eyepoint passing through said assumed three-dimensional scene and said two-dimensional presentation is closest to said eyepoint;

applying said raster formatted camera video signals to said display device when said first object is closest to said eyepoint;

applying said raster formatted digitally generated video signals to said display device when said second object is closest to said eyepoint; and

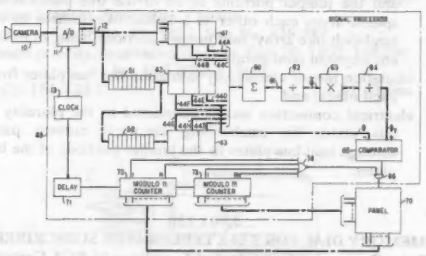
modulating in response to said applied camera and digitally generated raster formatted video signals said raster lines of said display device to generate a two-dimensional display of said three-dimensional scene as seen from said selected eyepoint wherein those portions of said first object not occluded by said second object are displayed and those portions of said second object not occluded by said first object are displayed.

3,961,134

BI-LEVEL DISPLAY SYSTEM

John Frederick Jarvis, Fair Haven, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 9, 1975, Ser. No. 576,163
Int. Cl.² H04N 5/66
U.S. Cl. 178—7.3 D **41 Claims**



1. A system for displaying a continuous tone image on a panel of selectively energizable display cells, comprising:

means for dividing an image to be displayed into a plurality of picture elements each corresponding to one of said display cells,

means for determining the intensity of ϕ of each of said picture elements, the maximum intensity of any picture element being designated ϕ_{max}

means for computing the average intensity $\bar{\phi}$ to in the neighborhood of each of said picture elements,

means for computing constrained averages ϕ_T from said neighborhood averages in accordance with the relationship

$$\phi_T = \gamma + \left(1 - \left(\frac{2\gamma}{\phi_{max}}\right)\right)\bar{\phi}$$

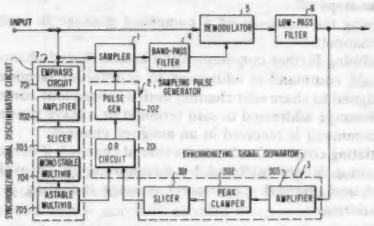
wherein γ is a constant, and

means for energizing a particular one of said display cells corresponding to a particular one of said picture elements if said intensity ϕ of said picture element bears a predetermined relationship to said constrained average ϕ_T computed for said picture element neighborhood.

3,961,135
SYNCHRONIZED DEMODULATION SYSTEM

Miyoji Ohyama; Yushi Uchida, and Tateo Onodera, all of Tokyo, Japan, assignors to Nippon Electric Company Limited, Tokyo, Japan

Filed Dec. 27, 1973, Ser. No. 429,016
Claims priority, application Japan, Dec. 29, 1972, 48-1295
Int. Cl.² H04N *3/16*; H03D *3/18*; H04B *1/68*
U.S. Cl. 178—7.3 R **7 Claims**



1. In a synchronized demodulation system including means for receiving a modulated carrier wave modulated by a composite signal containing first and second synchronizing signals having different time periods, said second synchronizing signal containing substantially no frequency components of said first synchronizing signal, the excess carrier ratio of said modulated carrier wave being smaller than unity but not smaller than 0.5, means for demodulating said modulated carrier wave by means of an internal carrier wave synchronized with the carrier rrequency component of said modulated carrier wave, thereby to regenerate said composite signal, means for separating said first synchronizing signal from said regenerated composite signal, means for generating sampling pulses upon reception of said separated first synchronizing signal, means for sampling said modulated carrier wave by said sampling pulses to derive a carrier burst signal, and means for selecting the carrier frequency component from said carrier burst signal to deliver said internal carrier wave for demodulation in said demodulating means, the improvement comprising:

means responsive to said modulated carrier wave for generating a gate pulse in the time period of said second synchronizing signal;

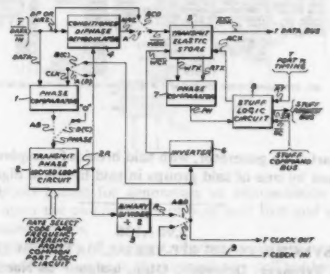
means responsive to said gate pulse for generating self-running synchronizing pulses with a repetition rate substantially equal to that of said first synchronizing signal during the time period of said gate pulse; and

means responsive to said self-running synchronzing signal for generating addition sampling pulses to be applied to said sampling means during the time period of said gate pulse.

3,961,136
DIGITAL DATA TRANSMIT AND RECEIVE CHANNEL MODEM

Stuart Barry Cohen, Nutley; James Monroe Clark, Cedar Grove, and Arthur Howard Magnus, Succasunna, all of N.J., assignors to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Apr. 25, 1975, Ser. No. 571,677
Int. Cl.² H04L *27/18*
U.S. Cl. 178—67 **20 Claims**



1. A digital data transmit and receive channel modem comprising:

a first source of data to be transmitted having a bit rate equal to a first given one of a predetermined number of different bit rates;

a transmit phase locked loop coupled to said first source;

a diphase demodulator coupled to said first source and said transmit phase locked loop to provide output data for transmission;

a second source of received data having a bit rate equal to a second given one of said predetermined number of different bit rates,

a third source of a receive write timing signal;

a fourth source of a receive read timing signal;

a receive phase locked loop coupled to said third and fourth sources; and

a diphase modulator coupled to said second source and said receive phase locked loop to provide output data for utilization.

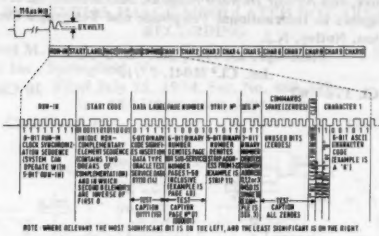
3,961,137
BIPHASE DIGITAL TELEVISION SYSTEMS

Peter Richard Hutt, Richmond; Alan Ronald Blake, London; Gunter von Cavallar, South Wonston, near Winchester; Brian Neil Douglas, London, and Philip John Dodds, Southampton, all of England, assignors to Independent Broadcasting Authority, London, England

Filed July 30, 1974, Ser. No. 493,111
Claims priority, application United Kingdom, July 30, 1973, 36205/73
Int. Cl.² H04L *7/08*, *17/02*; H04N *7/00*
U.S. Cl. 178—68 **1 Claim**

1. Apparatus for processing groups of binary digital information, each group consisting of a series of binary digits for transmission, which apparatus comprises a bi-phase generator for converting the digits of the groups to a bi-phase digital form in which each digit is represented by a transition from a first signal level to a second signal level and the digits of the group are accordingly all represented by signals of the first level complemented by signals of the second level, a start code generator operable to provide repeatedly a binary digital start code of said bi-phase digital form but with a break of said complementation, a run-in signal generator operable to provide a run-in signal and means for feeding trains of output signals to an output from the apparatus at spaced-apart inter-

vals of time each train of output signals having a run-in signal from the run-in signal generator followed by a start code, from



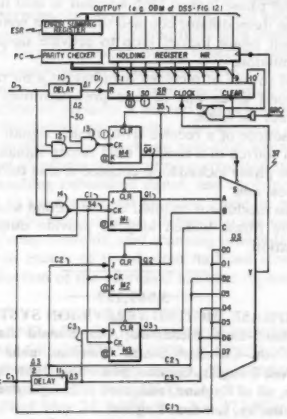
said start code generator, with said break of complementation and then by one of said groups in said bi-phase digital form.

3,961,138

ASYNCHRONOUS BIT-SERIAL DATA RECEIVER

Frank Fellinger, Delaware, Ohio, assignor to North Electric Company, Galion, Ohio

Filed Dec. 18, 1974, Ser. No. 533,767
Int. Cl.² H04L *5/24, 7/00*
U.S. Cl. 178—69.5 R **18 Claims**



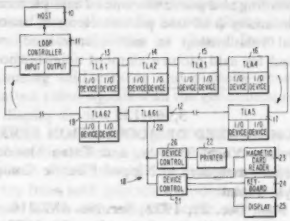
1. A data receiver for receiving data from a data line, said data being in asynchronous bit serial form at a predetermined bit frequency in groups of N bits, the leading bit of each group being a start bit of one logic state; said data receiver comprising an N-stage shift register operative to clock data in from said data line under the control of said leading bit and synchronizing means, both said register and said synchronizing means being coupled to said data line, and with a clock connection from said synchronizing means to said shift register; means responsive to said leading bit to start said synchronizing means in order to select a phase relation to supply a train of clock pulses to said shift register at said given bit frequency via said clock connection in order to shift one of said groups from said data line into said shift register in accordance with the phase relation selected.

3,961,139

TIME DIVISION MULTIPLEXED LOOP COMMUNICATION SYSTEM WITH DYNAMIC ALLOCATION OF CHANNELS

Robert A. Bowman, San Jose; Guenther Keith Machol, Saratoga, both of Calif., and Rene Henri Terlet, Romsey, England, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 14, 1975, Ser. No. 577,507
Int. Cl.² H04J *6/02*
U.S. Cl. 179—15 AL **11 Claims**



9. A method for selectively dedicating a channel in a time multiplexed serial loop transmission system to a selected terminal, such that a plurality of terminals may share the same channel, each said terminal performing the method comprising the steps of:

sensing the presence of a command message in a shared channel;

inhibiting further communication in said shared channels if said command is addressed to a different terminal assigned to share said channel until a subsequent command message addressed to said terminal or a leave pass mode command is received in an assigned channel;

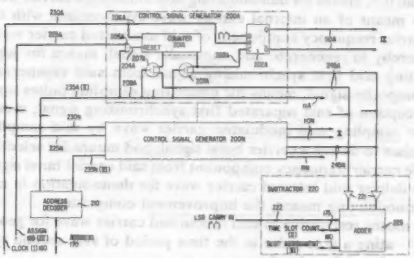
initiating communication in its shared channels if communication is not inhibited by transmitting in an available shared channel a command message including its own address.

3,961,140

LINE SWITCH CONTROLLER FOR A TIME-DIVISION SWITCHING SYSTEM

Robert Lawrence Carbrey, Boulder, Colo., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 21, 1975, Ser. No. 560,331
Int. Cl.² H04J *3/02*
U.S. Cl. 179—15 AT **8 Claims**



1. In a time division switching system capable of accommodating a plurality of calls, each among a different plurality of parties, said system including a time division bus, a plurality of line switches each operative, upon closure, to connect a different one of said parties to said time division bus and means for repetitively producing a signal having a sequence of distinct values defining a sequence of time slots during each

of which a different one of said calls is accommodated, the improvement comprising:

a plurality of means, each dedicated to one of said line switches, for generating a control signal having a selectable phase of said producing means signal, a predetermined value of said control signal being effective to close the corresponding line switch, and

means for subtracting from said producing means signal the control signal corresponding to the line switch of a particular party, the resulting difference corresponding to the time slot during which said party is accommodated.

3,961,141

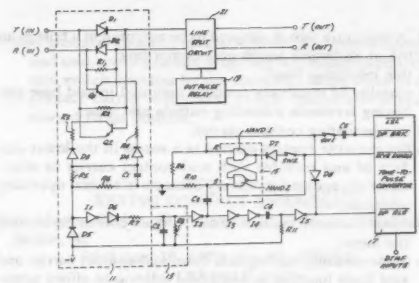
STOP TIME-OUT UNTIL AFTER FIRST DTMF DIGIT DIALED CIRCUIT

Raymond Ma, Seattle, Wash., assignor to Tel-Tone Corporation, Kirkland, Wash.

Filed Dec. 19, 1974, Ser. No. 534,195

Int. Cl.² H04Q 1/50

U.S. Cl. 179—16 EC **8 Claims**



1. A stop time-out until after first DTMF digit dialed circuit for a telephone tone-to-pulse converter that includes a time-out circuit that is normally enabled when said tone-to-pulse converter is enabled, said stop time-out until after first DTMF digit dialed circuit comprising:

a current sensing circuit for detecting when a telephone connected to said sensing circuit goes OFF HOOK;

a latch circuit connected to said current sensing circuit in a manner such that said latch circuit is set when said current sensing circuit senses that a subscriber has gone OFF HOOK;

connecting means for connecting said latch circuit to a tone-to-pulse converter in a manner such that said latch circuit prevents the time-out circuit of said tone-to-pulse converter from disabling the operation of said tone-to-pulse converter when said latch circuit is set; and,

primary resetting means for resetting said latch circuit, said primary resetting means being connected between the pulse output of said tone-to-pulse converter and the reset input of said latch circuit in a manner such that said latch circuit is reset when said tone-to-pulse converter generates an output pulse.

3,961,142

METHOD AND APPARATUS FOR AUTOMATICALLY ANNUNCIATING THE COMPLETION OF A TELEPHONE CALL HOLD INTERVAL

George S. Caffine, 11212 Valley View Ave., Kensington, Md. 20795

Filed Oct. 24, 1974, Ser. No. 517,627

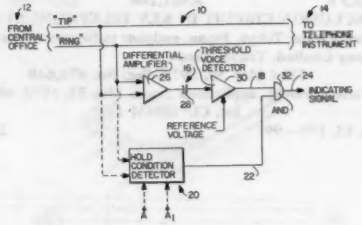
Int. Cl.² H04M 1/00, 3/22

U.S. Cl. 179—81 R **13 Claims**

1. An apparatus for annunciating the completion of a call hold interval in a telephone communication system, said apparatus comprising in combination:

hold detector circuit means automatically responsive to the presence of a call hold condition on a telephone communication line for providing a first audio detection signal;

voice frequency detector circuit means responsive to the presence of an audio signal on said telephone communication line for providing a second detection signal; and



logic circuit means for generating an annunciation signal only upon the concurrence of both said first and second detection signals;

whereby the return of one party during a call hold condition of the telephone line to thus complete a call hold interval can be signalled to another party to the call.

3,961,143

MULTI-FREQUENCY SIGNALLING SYSTEM

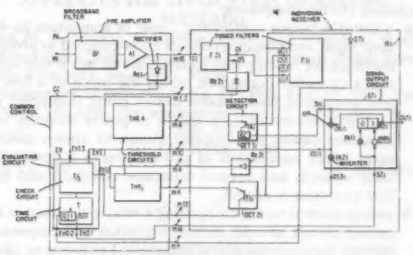
Guido Maria Josepha Benedikt Thyssens, Wilrijk, Belgium, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Sept. 11, 1974, Ser. No. 505,014

Claims priority, application Netherlands, Sept. 12, 1973, 7312548

Int. Cl.² H04M 1/50

U.S. Cl. 179—84 VF **19 Claims**



1. A multiple-frequency signalling system including multiple-frequency receiver means coupled to receive a plurality of alternating signals having different frequencies, said receiver means including an evaluating circuit to evaluate the presence of a predetermined number of said signals received by said receiver means, said receiver means further including a plurality of channel paths each including a first tuned filter responsive to signals of a selected frequency and each including inhibiting means which render said channel paths ineffective upon spurious signals being applied to them, a said channel path being rendered effective when simultaneously said channel path receives a signal having a frequency equal to that to which the filter included in this channel path is tuned and said evaluating circuit determines that a said predetermined number of signals is present, the inhibiting means included in each of said channel paths including a detection circuit coupled between a second tuned filter included in this path and said evaluating circuit, the detection circuit including means for

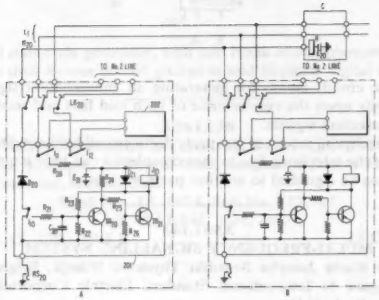
comparing a voltage value provided by the second filter with a threshold voltage value, said detection circuit providing an output when the difference between the compared voltages reaches a predetermined value, and the operation of said evaluating circuit being prevented by the output of said detection circuit, thus rendering said channel paths ineffective.

3,961,144

EXCLUSION CIRCUIT IN KEY TELEPHONE SYSTEM

Masao Hirate, Tokyo, Japan, assignor to Nippon Electric Company Limited, Tokyo, Japan

Filed May 30, 1974, Ser. No. 474,648
Claims priority, application Japan, May 31, 1973, 48-60230
Int. Cl.² H04M 1/68
U.S. Cl. 179—99 2 Claims



1. In a telephone set of the type having, an off-hook switch, and a key operated control for selecting a line circuit in common with other such telephone sets, said line circuit having a control wire corresponding thereto, the improvement being an exclusion circuit comprising:

a. a bistable circuit comprising a pair of transistors having their input and output terminals cross-coupled to provide feedback for holding said bistable circuit in a stable state, and a capacitor connected across the input of a first of said transistors, said bistable circuit being connected via said off-hook switch to a source of power whereby said capacitor causes said bistable circuit to always assume upon initial application of power thereto a first stable state wherein said second transistor conducts and said first transistor is cut off,

b. switch control means comprising a relay connected in the output circuit of said second transistor and responsive thereto for controlling first and second switches to cause said first and second switches to switch from their respective normal positions to their respective alternate positions when said bistable circuit is in said first stable state,

c. said first switch means in its normal position being connected between said control wire and a reference potential via said off-hook switch, and in its alternate position being connected between said control wire and a trigger input to said bistable circuit, and

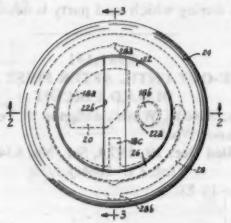
d. said second switch means in its normal position being connected between said line circuit via said key operated control and a speech network for said set, and in its alternate position disconnecting said line circuit via said key operated control, whereby a non-reference potential on said control wire at the time of switching of said first switch causes said bistable circuit to assume its second stable state, and whereby a reference potential on said control wire at the time of switching of said first switch keeps said bistable circuit in its first stable state thereby to disconnect said speech network of the telephone set from said line circuit.

3,961,145

MINIATURE ELECTRONIC WATCH SWITCH

Werner B. Halbeck, Mequon, Wis., assignor to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed Dec. 12, 1974, Ser. No. 532,155
Int. Cl.² H01H 19/58
U.S. Cl. 200—155 A 10 Claims



1. A miniature switch adapted to be mounted in a hole in an electric or electronic watch case comprising:

a thin insulating base;

a plurality of stationary contacts mounted in said base and having terminals extending outside said base;

a thin insulating contact carrier;

a flat movable contact carried in a recess in the lower surface of and movable with said contact carrier to selectively engage said stationary contacts in several operating positions;

a thin metal knob secured to said contact carrier for moving the latter;

a frame securely holding said base, said contact carrier and said knob together in assembled relation to afford actuation of said knob and said contact carrier and said movable contact therewith while said base and said stationary contacts remain immobile;

and detent means affording a good feel for stopping said switch in each of its operating position when said knob is actuated comprising:

a detent ring member clamped between said frame and the peripheral portion of said base;

a detent spring member having a pair of arms biased in opposite directions against said detent ring member;

means locking said detent spring member to said contact carrier for movement therewith;

and bumps on one of said members and notches on the other member defining said operating positions of the switch, said bumps entering said notches to provide a good feel enabling accurate stopping of the switch in any one of its operating positions when said knob is actuated.

3,961,146

PRETRAVEL SWITCH FOR PORTABLE TOOLS

Merlin R. Dummer, Arab, Ala., assignor to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed Oct. 9, 1974, Ser. No. 513,249
Int. Cl.² H01H 13/08
U.S. Cl. 200—157 11 Claims

1. A self-enclosed electric switch comprising:

a switch housing including an insulating base;

stationary contact means mounted in said base;

a movable contact arranged to be moved into and out of contact with said stationary contact means;

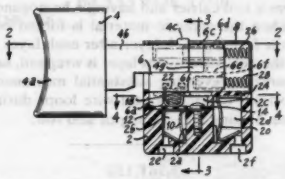
a contact carrier having a normal off position and being coupled to said movable contact;

a switch operator having a normal off position and being actuatable to move said contact carrier into an on position wherein said movable contact engages said stationary contact means;

means in said switch housing mounting said switch operator and said contact carrier for limited movements on said base;

first biasing means biasing said contact carrier with respect to said housing into its off position;

second biasing means biasing said switch operator with respect to said housing into its off position;



and pretravel coupling means between said switch operator and said contact carrier affording substantial pretravel of said switch operator before applying closing force to said contact carrier when said switch operator is actuated toward its on position.

3,961,147

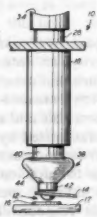
KEYING CONTACT ASSEMBLY

Kay Alonas, Skokie, Ill., assignor to Teletype Corporation, Skokie, Ill.

Filed Apr. 10, 1974, Ser. No. 459,826

Int. Cl.² H01H *3/12*

U.S. Cl. 200—159 B **12 Claims**



1. A keying contact assembly for moving one contact of a contact pair into engagement with the other contact of the contact pair and for developing a subsequent signal providing valid assurance of closure of the contact pair which comprises:

resilient feedback means aligned to bear directly upon the one contact of the contact pair for forcing the one contact into engagement with the other contact and, subsequent to closure of the contact pair, for exhibiting a negative force displacement characteristic which provides indications of the closure of the contact pair;

moveable means aligned with and spaced from the contact pair and coupled to the resilient feedback means for moving the resilient feedback means to force the one contact into engagement with the other contact; and

means for mounting the moveable means for movement toward the contact pair to close the contact pair.

3,961,148

DRY-REED CONTACT CONSTRUCTION

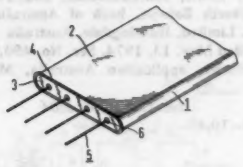
Rolf Abele, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Oct. 23, 1974, Ser. No. 517,238

Claims priority, application Germany, Oct. 23, 1973, 2353124

Int. Cl.² H01H *1/02;* **C25D** *5/50*

U.S. Cl. 200—268 **4 Claims**



1. A dry-reed contact electric switch having terminal elements constructed of a metal core having a nickel and copper covering, which terminal elements extend from a housing for said switch in an airtight manner through fusible glass beads, said metal core having a coefficient of expansion matched to that of said glass forming said fusible beads, wherein said terminal elements are formed in accordance with the following steps:

covering said metal core in sequence with a sheath of copper and then with a sheath of nickel in a quantity ratio equal to or slightly less than 1 part nickel to 5 parts copper and

exposing said terminal elements, so covered, to a temperature of from 750° to 980° C. during a melting period of such duration that at least 85 percent of said nickel sheath is diffused into said copper sheath.

3,961,149

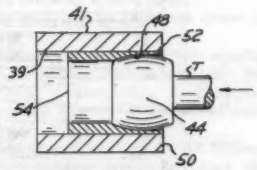
APPARATUS FOR APPLICATION OF BEARING MATERIAL

John M. Robertson, Northville, Mich., and Wilbur E. Wyatt, Greensburg, Ind., assignors to Gulf & Western Metals Forming Company, Southfield, Mich.

Continuation-in-part of Ser. No. 174,885, Aug. 25, 1971, Pat. No. 3,786,555. This application Sept. 21, 1973, Ser. No. 399,392

Int. Cl.² B23K *13/00*

U.S. Cl. 219—9.5 **18 Claims**



1. Apparatus for applying bearing material to a cylindrical opening in a body and producing a metallurgical bond between the body and the bearing material which comprises a substantially sealed housing, an induction heater in said housing, a support within said housing for said body, means for relatively moving said support and heater to cause said heater to enter the cylindrical opening in said body to heat the surface of the opening, a tubular anvil associated with said housing, means for advancing the body to overlie said anvil with its opening in alignment with the opening in said tubular anvil, a ram having a portion movable toward and away from said anvil, a circular tool connected to said ram for movement therewith and dimensioned to move through the opening in

the body with a clearance which determines the thickness of the bearing material deposited on and bonded to the inner surface thereof, said tool having a tapered leading edge effective to apply radial pressure to a sleeve of bearing material within said opening to spread and bond the bearing material to the surface of the opening.

3,961,150

STERILIZATION APPARATUS

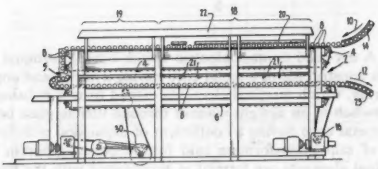
Peter Sydney Lewis, Murrumbeena, and Franklin Marius Lohning, North Balwyn, both of Australia, assignors to Tarax Pty. Limited, Huntingdale, Australia

Filed Mar. 13, 1974, Ser. No. 450,922

Claims priority, application Australia, Mar. 14, 1973, 2597/73

Int. Cl.² H05B 5/04

U.S. Cl. 219—10.49 **28 Claims**



1. Apparatus for sterilizing the contents of sealed containers which containers comprise electrically conductive material, the apparatus comprising support means to support containers and to rotate them first in one sense and then in the opposite sense to impart substantial relative motion between the containers and their contents, and induction heating means disposed in close proximity to said rotating containers to heat the rotating containers to rapidly heat the contents of the containers to the heat of sterilization.

3,961,151

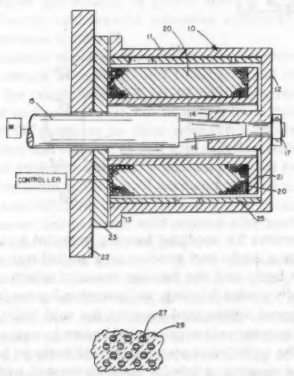
HEATED ROLL INDUCTIVE HEATER CONSTRUCTION

Kenneth H. Danner, Nashville, Tenn., assignor to Rosemount Inc., Eden Prairie, Minn.

Filed June 3, 1974, Ser. No. 475,457

Int. Cl.² H05B 5/08

U.S. Cl. 219—10.49 **3 Claims**



1. A heated roll construction for processing synthetic fibers and the like comprising a rotatable shaft, a synthetic fiber processing roll member mounted on said shaft and rotatable therewith, a stationary coil carrier mounted on the interior of said roll, an induction heating coil comprising a length of wire wrapped on said coil carrier in helical fashion forming a plurality of loops of wire positioned side by side in an inner layer on the coil carrier and wrapped to form a plurality of subsequent layers of wire loops wrapped over said inner layer, said length of wire having a loose woven inorganic insulation material thereon when wrapped on said coil carrier, and a ceramic support material spacing each of the loops of wire from the other loops and substantially filling all voids between the loops of wire in each of said layers and between the layers of wire loops to form a coil carrier and having a homogeneity obtainable only when the ceramic material is forced between the loops of wires forming each layer after each layer is wrapped and before the next subsequent layer is wrapped, said ceramic material thereby preventing substantial movement between adjacent portions of each of said wire loops during rotation and alternate heating and cooling of said roll.

3,961,152

MAGNETRON POWER SUPPLY AND CONTROL CIRCUIT

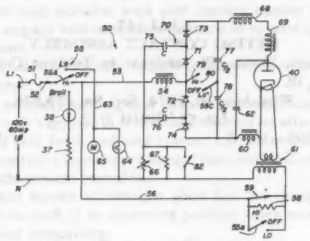
James E. Staats, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Division of Ser. No. 430,730, Jan. 4, 1974, Pat. No. 3,855,440.

This application Nov. 21, 1974, Ser. No. 525,856

Int. Cl.² H05B 9/06

U.S. Cl. 219—10.55 B **2 Claims**



1. Electronic heating apparatus comprising metal wall structure defining a heating cavity, an antenna galvanically insulated from said wall structure and arranged to radiate microwaves into said heating cavity, a crossed-field discharge device including a pair of input terminals and a pair of output terminals, said device being characterized by the production of an a.c. voltage of ultra-high frequency across the output terminals thereof in response to the application of a d.c. voltage across the input terminals thereof, means capacitively coupling said output terminals respectively to said metal wall structure and to said antenna, a voltage converter including a pair of input terminals adapted to be connected to an associated low frequency a.c. supply source having a voltage in the general range of 110 to 125 volts and a pair of output terminals respectively connected to the input terminals of said device, said voltage converter further including four series-connected rectifiers, two input capacitors connected in parallel with the inner two of said rectifiers, two output capacitors connected in parallel with said four rectifiers, the capacitance of each of said input capacitors being twice the capacitance of each of said output capacitors, and a choke coil having an input terminal adapted for connection to the associated source of low voltage a.c. power and an output terminal adapted for connection to a first junction between said two inner rectifiers and to a second junction between said two output capacitors, said converter being characterized by the production of a d.c. output voltage across the output terminals thereof in response to the application of a low frequency a.c. input voltage across the input terminals thereof, the maximum amplitude of the d.c. output voltage from said converter being

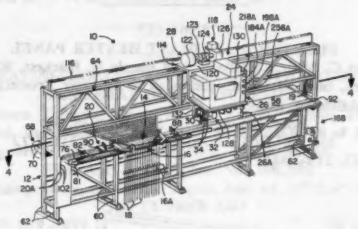
approximately four times the peak value of the a.c. input voltage to said converter.

3,961,153

MACHINE FOR FABRICATING A WIRE NETWORK

Elmer O. Smith, Compton, and Samuel Weinstein, Culver City, both of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed May 24, 1974, Ser. No. 473,109
Int. Cl.² B23K 11/10
U.S. Cl. 219—56 8 Claims



1. A welding machine for fabricating a wire network comprising:

a frame having a welding station;

first wire holding means on said frame for supporting a group of first wires in side by side fixed relation within said welding station;

second wire holding means on said frame for supporting at least one second wire in fixed welding position within said station wherein the latter wire extends in a transverse direction of said first wires, whereby said first and second wires cross one another;

welding means on said frame for welding said first and second wires to one another at their crossing points, said welding means comprising a carriage mounted on said frame for movement through said welding station in said transverse direction, a welding electrode on said carriage, means for driving said carriage through said station in a manner such that movement of said electrode occurs along the second wire in welding position and across said wire crossing points in succesion, means on said carriage for sensing the successive wire crossing points during movement of said carriage through said welding station and producing a stop signal in response to sensing of each crossing point, control means for activating said drive means to drive said carriage in the absence of a stop signal and inactivating said drive means to arrest said carriage for a predetermined time interval in response to each stop signal and in a position wherein said electrode is aligned with the corresponding wire crossing point, and means for retracting said electrode from contact with said wires during movement of said carriage from one wire crossing point to the next and extending said electrode into contact with the aligned wire crossing point each time the carriage is arrested at a wire crossing point; and

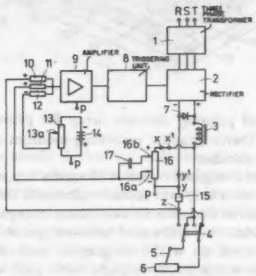
said first wire holding means including means for intermittently advancing said first wires endwise through said welding station, whereby second wires may be welded to said first wires at positions spaced along the first wires to form a wire network.

3,961,154

DIRECT CURRENT POWER SUPPLY FOR MANUAL ARC WELDING

Rolf Ericsson, Laxa, Sweden, assignor to Elektriska Svetsningsaktiebolaget, Goteburg, Sweden

Continuation of Ser. No. 352,446, April 18, 1973, abandoned.
This application Oct. 16, 1974, Ser. No. 515,415
Claims priority, application Sweden, Apr. 18, 1972, 4964/72
Int. Cl.² B23K 9/10
U.S. Cl. 219—135 3 Claims



1. A direct current power supply for manual arc welding having a steeply drooping, adjustable volt-ampere characteristic comprising

a polyphase transformer having a plurality of secondary output leads carrying mutually phase displaced voltages, a polyphase rectifier system connecting said secondary output leads to a pair of D. C. welding current conductors, said rectifier system comprising a set of triggered rectifier valves connected one in series with each of said secondary output leads, said triggered rectifier valves having each a trigger terminal for initiating current flow through the valve,

means for periodically supplying igniting pulses to each of said trigger terminals, including means for causing the angular position of said pulses to vary in response to a direct current control signal, and,

means for producing said direct current control signal comprising the following means, to wit,

a. means for producing an adjustable direct current reference signal,

b. means including a welding current sensing means for producing a welding current feed-back direct current signal bearing a substantially fixed proportion to the welding current carried by the pair of welding current conductors,

c. means including a welding voltage sensing means for producing a welding voltage feed-back direct current signal proportional to the welding voltage between said welding current conductors,

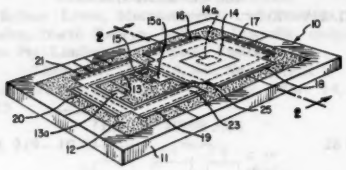
d. summing means for combining said reference signal, said welding current feed-back signal and said welding voltage feed-back signal into a compound signal constituting the control signal aforementioned, both of said feed-back signals being supplied to said summing means in opposing relationship to said reference signal, said means for producing a welding voltage feed-back signal including means for adjustment of the slope of the volt-ampere characteristic of the power supply through adjustment of the ratio of said welding voltage feed-back signal to the welding voltage independently of the ratio of the welding current feed-back signal to the welding current.

3,961,155

THERMAL PRINTING ELEMENT ARRAYS

Lawrence A. Weldon, Harleysville, Pa., and Peter Bokalo, Metuchen, N.J., assignors to Gulton Industries, Inc., Metuchen, N.J.

Filed June 24, 1974, Ser. No. 482,003
Int. Cl.[2] H05B 1/00
U.S. Cl. 219—216 12 Claims



1. A thermal printing element array for printing selected symbols on a thermographic recording medium comprising:

a substrate member;

a plurality of elongated resistive elements supported by said substrate member, said resistive elements being arranged in a pattern so that selective electrical energization of said resistive elements will cause selected symbols to be thermally printed on a thermographic recording medium placed in cooperative relation with said resistive elements; and

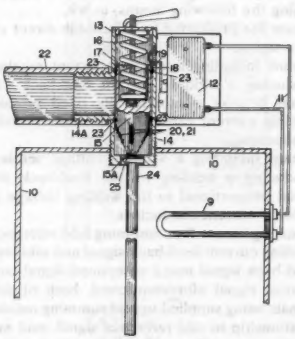
a plurality of electrical conductors supported by said substrate member, each of said resistive elements being electrically connected to a pair of said electrical conductors, and each of said electrical conductors being connected along the long dimension of a respective one of said elongated resistive elements so that electrical current path between said conductors is across the short dimensions of said resistive elements.

3,961,156

COMBINATION TEMPERATURE AND PRESSURE RELIEF VALVE WITH ENERGY CUTOFF SWITCH

Thayer E. Patton, 223 Raintree Lane, Chattanooga, Tenn. 37421

Continuation-in-part of Ser. No. 478,901, June 13, 1974, Pat. No. 3,873,808. This application Mar. 24, 1975, Ser. No. 561,067
Int. Cl.[2] F24H 1/00
U.S. Cl. 219—331 4 Claims



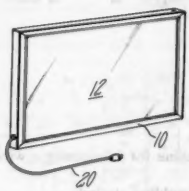
1. A device for limiting the temperature and pressure of a fluid by controlling the electric current to an element (9) for heating the fluid which comprises a tank (10), a support assembly (13) for the device adapted to be inserted through a wall of the tank, the assembly including a cylinder (14) having a discharge opening (14A), a pressure responsive piston (15) having a somewhat pointed lower end (15A) movable within the cylinder, a compression spring (16) opposing movement of the piston, an actuator (19) extending within the cylinder through the support assembly and adapted to be operated by movement of the piston, a microswitch (12) operable by the actuator to break an electric circuit (11) to the heating element, a discharge pipe (22) having an internally threaded end for attachment to external threads on the discharge opening (14A) of the cylinder, and a temperature responsive element (24) mounted within the tank, the element being connected to the piston to push the piston against the actuator of the microswitch to break the electric circuit to the heating element and a discharge conduit (20) for the overflow of fluid from the cylinder.

3,961,157

ELECTRICAL RADIANT HEATER PANEL

Robert C. Miller, Madison, and Barrie H. Hackett, Haddam Neck, both of Conn., assignors to Safeway Products Inc., Middletown, Conn.

Filed Jan. 6, 1975, Ser. No. 538,642
Int. Cl.[2] H05B 3/28; F24H 9/00; B32B 3/12
U.S. Cl. 219—345 3 Claims



1. A radiant heater comprising:

a planar front panel formed of an electrically non-conductive material, said front panel having a first radiation emitting surface and a second interior surface;

heating element means adhesively bonded to said second surface of said front panel, said heating element means including a resistance heater, thermal energy radiated by said resistance heater being transferred to said front panel by conductance;

heat reflector means adhesively bonded to said heating element means on the opposite side of said heating element means from said front panel, said heat reflector means being an integral unit comprised of:

a first planar layer of electrically non-conductive flame retardant material, said first layer being disposed adjacent to said heating element means and being oriented parallel to the plane of said front panel;

a honeycomb cell defining member, said cell defining member being formed from an electrically non-conductive flame retardant material, a first forwardly facing side of said cell defining member being bonded to the rearwardly facing side of said reflector means first layer whereby open cells of said member are exposed to and oriented generally perpendicular to said first layer; and

a planar laminate including a layer of electrically conductive material and a layer of electrically non-conductive flame retardant material, said laminate being positioned at the rearwardly disposed side of said honeycomb cell defining member, said layer of electrically conductive material of said laminate facing and being exposed to the interior of the honeycomb cells whereby heat radiated rearwardly from said heating element means will be incident on said layer of conductive material in a substantially perpendicular direction, the

material and surface characteristics of said electrically conductive layer being selected to provide a high degree of reflectivity of the incident thermal radiation;

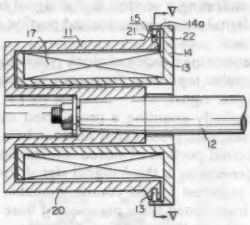
a rear panel comprised of an electrically non-conductive material, said rear panel being bonded to the layer of electrically non-conductive material of said heat reflector means planar laminate; and

over temperature protection means for said heater, said protection means including a temperature sensitive element connected in series with said heating element means resistance heater, said protection means being positioned entirely within said honeycomb cell defining member between said first and electrically conductive layers of said heat reflector means, said protection means being spaced from said electrically conductive layer and being separated from said heating element means only by said first layer of non-conductive material.

3,961,158
HEATING ROLLER APPARATUS WITH PRECISE TEMPERATURE MEASUREMENT

Muneharu Tabuchi, Otsu; Shosen Bando, Kyoto; Tadashi Tabei, and Yasuhiro Asai, both of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Apr. 5, 1973, Ser. No. 348,032
Claims priority, application Japan, Apr. 14, 1972, 47-36973
Int. Cl. H05b *1/02*
U.S. Cl. 219—471 **18 Claims**

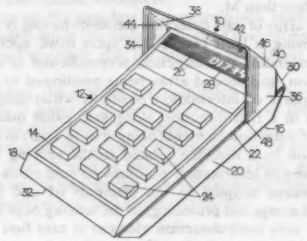


1. A heating roller apparatus comprising: a roller member having a cylindrical wall and defining a space in the inside thereof and an annular groove in said cylindrical wall; a rotatably supported drive shaft, means rigidly and concentrically supporting one end of the roller member on an end of the drive shaft; heat source means stationarily positioned in the inner space of the roller member for heating the cylindrical wall, stationary flange means having a support extending into said inner space for supporting said heat source means, said flange means being positioned adjacent the other end of said roller member,; and a temperature sensor having a measuring probe stationarily positioned in the annular groove of the cylindrical wall for measuring a temperature of the cylindrical wall of the roller member, said annular groove being located at a position adjacent to said other end of said roller member and having an opening on the outer surface of said cylindrical wall, and two adjacent circumferentially extending wall faces which penetrate into said cylindrical wall and are substantially perpendicular to the axis of said roller member, said wall faces being spaced from said measuring probe of said temperature sensor; and a metal covering of low thermal capacity and high thermal conductivity extending from said flange means over said opening of said annular groove, said covering facing said opening at a determined distance therefrom and being exposed thereto.

3,961,159
LIGHT SHIELD/SUPPORT DEVICE

Martin E. Hursey, 5 Pimlico Road, Greenville, S.C. 29601

Filed June 5, 1975, Ser. No. 584,064
Int. Cl.² G06C *29/00*
U.S. Cl. 235—1 D **10 Claims**



1. A light shield device for reducing glare on the display window of a portable numerical calculator having a housing defined by vertically spaced upper and lower surfaces joined by spaced opposed upright sidewalls, a plurality of numbered and operational keys carried on said upper surface, said display window located on said upper surface for displaying lighted numbers produced by carrying out numerical operations with said keys, said light shield comprising:

a pair of spaced shank members;

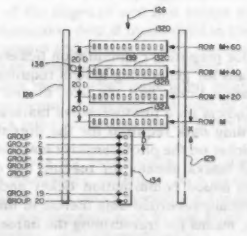
attachment means including an inwardly extending flange carried adjacent a lower portion of each said shank member for being received over the exterior surface of said spaced opposed sidewalls of said housing for removably securing said shank members to said exterior surface of said sidewalls; and

an upper hood member integral with said shank members extending substantially above and across said display window for shielding said window and the lighted numbers displayed there from oncoming light effectively reducing the glare thereon so that the lighted numbers are more easily and accurately readable.

3,961,160
CARD READER

Richard A. Gorgens, Bedford, Mass., assignor to Incoterm Corporation, Natick, Mass.

Filed Mar. 28, 1974, Ser. No. 455,928
Int. Cl.³ G06K *7/14*, *19/06*
U.S. Cl. 235—61.11 E **24 Claims**



1. Apparatus for reading the information stored on a card in a plurality of information positions forming a data matrix, said matrix having M rows by N columns with each information position being characterized by one of two states representing a binary zero or a binary 1, comprising,

guide means for accepting a manually inserted card and guiding said card in a first direction along a predeter-

mined path as said card is inserted in said guide means at an arbitrary speed,

a first linear array of data detection elements extending in said first direction and positioned adjacent to said guide means, said elements being spaced apart in a fixed relation to the spacing between rows of information positions on said card, the number of said data detection elements being less than M,

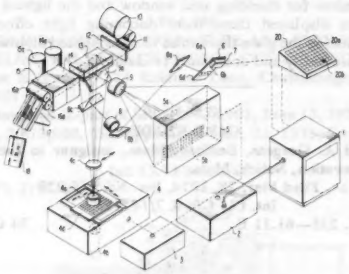
a second array of data detection elements having N columns comprising at least two spaced apart rows, each of said rows extending in a direction perpendicular to said first direction, said second array being positioned to underlie said matrix of information positions when said card is passed in a first direction along said guide means, said rows of detection elements being spaced apart in said first direction by a distance related to the spacing between said rows of information positions on said cards, and

circuit means coupled to the elements of said first and second arrays and providing, as the leading edge of a card passes over each detection element in said first array at said arbitrary speed, that the detection elements of said second array are read out to provide output signals indicating the binary value of each information position for predetermined ones of the rows of said data matrix on said card overlying said second array.

3,961,161
SYSTEM FOR PREPARING COMMUTATION TICKET AND THE LIKE

Hiroyuki Ueda, and Yukio Sawano, both of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Apr. 24, 1974, Ser. No. 463,720
Claims priority, application Japan, Apr. 24, 1973, 48-46401
Int. Cl.² G06K *1/14, 7/10;* G03G *16/00;* G09F *11/06*
U.S. Cl. 235—61.11 F **4 Claims**

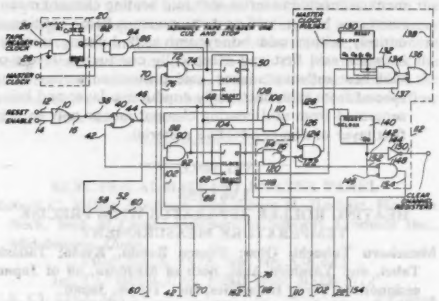


1. A system for preparing commutation tickets and the like comprising means for generating indicia required for providing a commutation ticket and the like, means for optically recording the indicia on a photosensitive material, means for optically recording data required for the preparation of the commutation ticket on the photosensitive material as machine readable digital marks, means for reading the digital marks recorded on an issued commutation ticket and the like for utilizing the optically recorded data therein in the preparation of a new ticket, means for transcribing the name and age of a commuter from a commuter ticket request card, means for feeding said photosensitive material through an exposing device, a developing device, and an image stabilizing device, and a keyboard for introducing all the data required for preparing a commutation ticket and the like into a minicomputer, wherein said means for generating indicia comprises an ultramicrofiche and a display panel controlled by said minicomputer.

3,961,162
METHOD AND APPARATUS FOR INTERRUPTING A DEVICE FOR A PRESELECTED INTERVAL OF TIME

William R. Wells, Linwood, N.J., assignor to United Audio Visual Corporation, Mays Landing, N.J.

Filed Dec. 31, 1974, Ser. No. 537,750
Int. Cl.² G06K *7/10;* H01H *43/08*
U.S. Cl. 235—61.11 E **13 Claims**



1. Apparatus for interrupting a device for a preselected interval of time in response to information in a storage medium, comprising:

means for generating a first digital signal in response to a first portion of said stored information for interrupting said device;

means for generating a second digital signal in response to said first digital signal and a second portion of said stored information;

means for generating a series of clock pulses having a predetermined pulse repetition frequency in response to said second digital signal;

means for digitally counting a preselected number of said clock pulses, said preselected number being determined by said second portion of stored information; and

means for generating a third digital signal for starting said device in response to said counting means, whereby said device is interrupted for a preselected time period determined by the pulse repetition frequency of said clock pulses.

3,961,163
PROGRAMMABLE DIGITAL/ANALOG MEMORY SYSTEM

Clarence H. Stevenson, III, 303 W. Glenoaks Blvd., Glendale, Calif. 91202

Division of Ser. No. 407,433, Oct. 18, 1973, Pat. No. 3,915,851, which is a continuation of Ser. No. 334,210, Feb. 21, 1973, abandoned. This application Apr. 10, 1975, Ser. No. 566,669
Int. Cl.² G06K *7/06*
U.S. Cl. 235—61.11 A **12 Claims**

1. A digital memory system comprising

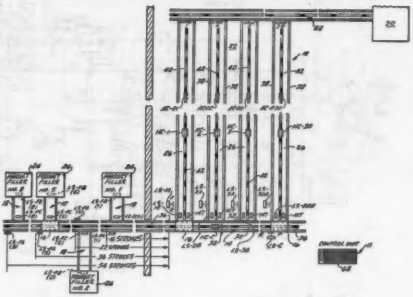
a. a plurality of movable memory bands;

b. means for coding each memory band with information bits representing a predetermined memory condition for each memory band;

c. a series of separate decoding circuits, each circuit being activated for decoding the memory condition of a selected coded memory band; and

d. a programming unit for associating each decoding circuit with information bits in a selected one of any of the memory bands, the programming unit including a matrix of circuit input means arranged to provide a separate series of said input means in circuit connection with each decoding circuit, the several input means in each series being associated with corresponding ones of the memory

bands; and a series of separate movable circuit elements, each circuit element being in circuit connection with a separate one of the decoding circuits, each circuit element also being removably connectible to any one of the several input means associated with the decoding circuit to which the circuit element is connected for selectively decoding any of the memory bands, the information bits



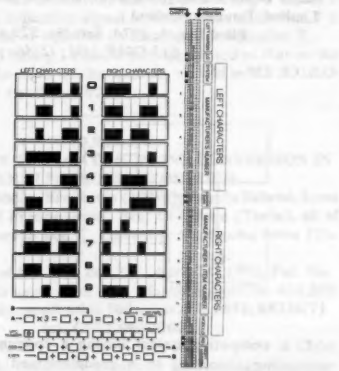
traveling on a selected memory band cooperating with the circuit element being connected to the input means associated with the selected memory band to activate the decoding circuit which thereby decodes the memory band.

3,961,164

UPC ENCODATION VERIFIER

George T. Reed, and Laura Seidler-Gordon, both of Newark, Del., assignors to Westvaco Corporation, New York, N.Y.

Filed Sept. 13, 1974, Ser. No. 505,906
Int. Cl.[2] G06K *19/02;* **G09C** *1/04;* **G06K** *5/00*
U.S. Cl. 235—61.12 N **1 Claim**



1. A method for verifying the accuracy of an encoded linear bar code symbol comprising in combination a template and an encodation worksheet, said template comprising a substantially rigid and transparent planar sheet having an image printed thereon, said image consisting of a plurality of equally spaced dark bars and intervening light spaces corresponding to the modules of a linear bar code symbol, said encodation worksheet comprising a printed sheet including a character chart of the module representation of the numeric equivalents of a linear bar code symbol, a formula for determining the check character of said bar code symbol and a bar chart consisting of two columns divided into equally sized spaces corresponding to the modules of said bar code symbol, said columns comprising a chart column and a verifier column, said method comprising the steps:

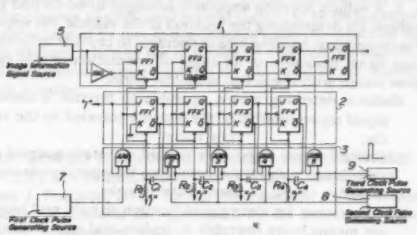
a. translating the numeric equivalent of an encoded linear bar code symbol into its graphic representation with the aid of the character chart on said encodation worksheet;
b. entering the graphic representation of the translation made in step (a) in the chart column of the bar chart on said encodation worksheet;
c. orienting the template in superimposed relation to said encoded linear bar code symbol and comparing the image on said template with the modules of said bar code symbol;
d. entering the graphic representation of the comparison made in step (c) in the verifier column of the bar chart on said encodation worksheet; and,
e. correlating the graphic representations of the encoded bar code symbol as entered in the chart and verifier columns of said encodation worksheet in order to verify the accuracy of said encoded symbol.

3,961,165

IMAGE INFORMATION TRANSFER DEVICE

Kenji Fukuoka, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed June 20, 1974, Ser. No. 481,400
Claims priority, application Japan, June 21, 1973, 48-69145
Int. Cl.[2] H04N *1/02*
U.S. Cl. 235—92 SH **3 Claims**



1. An image information transfer device comprising:
first means comprising a shift register **1** including a plurality of stages arranged in sequential order for memorizing input image information data;
second means comprising a shift register **2** having a plurality of stages which are the same in number as said stages of said first means and are arranged in sequential order for memorizing data representing a memorized condition in each stage of said first means;
means for causing the first of said stages of said second means to memorize data representing that data is present in a first of the stages of said first means when said input image information data is memorized in said first stage of said first means and memorize data representing that said input image information data is absent in said first stage of said first means when said input image information data is not memorized in said first stage of said first means (first clock pulse generating source **7**, AND1 and connections);
comparing means for periodically comparing data representing a memorized condition of a given stage of said second means with data representing a memorized condition of a stage arranged next to said given stage (AND2, AND3, AND4... and connections);
means for transferring input image information data memorized at that stage of said first means which corresponds to said given stage of said second means to a stage next to that stage of said first means when said comparing means detects that said data representing said memorized condition of said stage arranged next to said given stage of said second means represents that data is absent and

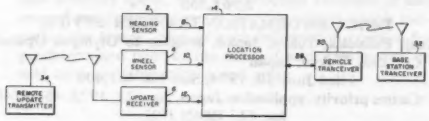
simultaneously transferring said data representing said memorized condition of said given stage of said second means to said stage arranged next to said given stage (second clock pulse generating source 8, AND2, AND3, AND4 and connections); and

means for reading out an input image information data memorized at the final stage of said first means when data representing a memorized condition in the final stage of said second means is data representing that a data is present in the final stage (third clock pulse generating source 9, AND5, FF5 and connections).

3,961,166
VEHICLE LOCATING APPARATUS

Charles R. Stobart, Richardson, Tex., assignor to E-Systems, Inc., Dallas, Tex.

Filed Jan. 24, 1975, Ser. No. 543,883
Int. Cl.² G06F *15/50*
U.S. Cl. 235—150.27 **8 Claims**



1. A vehicle locating apparatus arranged to be carried by a vehicle for determining the location of the vehicle, the apparatus comprising: heading means operable to provide an orientation signal indicative of an angle of orientation of said compass means with respect to magnetic north;

distance detecting means operable to provide a distance signal representative of the distance traveled by the vehicle;

processor means responsive to said orientation signal and said distance signal for providing location signals representative of the location of the vehicle;

storage means for storing said location signals, said processor means being operable to update said stored location signals whenever the vehicle has traveled a predetermined distance; and

receiving means operable when the vehicle is within predetermined areas, for receiving predetermined position signals corresponding to the predetermined areas, said processor means being responsive to said position signals for updating said stored location signals in accordance with said received position signals.

3,961,167
PCM TONE RECEIVER USING OPTIMUM STATISTICAL TECHNIQUE

Jeffrey P. Mills, Forest Park, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

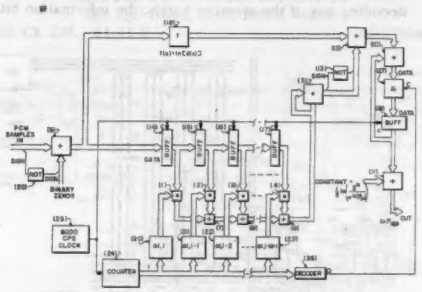
Filed July 22, 1974, Ser. No. 490,450
Int. Cl.² G06F *15/36*; H04Q *11/00*
U.S. Cl. 235—152 **8 Claims**

1. A pulse code modulation (PCM) tone receiver for determining the probability that a particular combination of audio frequencies was transmitted by monitoring PCM samples, said PCM tone receiver comprising:

means for storing N PCM samples as received, where N is an integer, c_1 through c_N representing a quantization of the analog voltage waveform sampled;

first means for multiplying said N samples represented by c_1 through c_N by a set of fixed predetermined constants a_{i1} through a_{iN}, where i is a fixed point binary number ranging from 1 to N and where a_{i1} through a_{iN} are determined from the covariance matrix of the process represented by the particular tone combination to be detected, said first multiplying means including means for storing said fixed predetermined constants a_{i1} through a_{iN}, said first multiplier means operating on said stored output of said storage means;

means for combining said multiplied products of samples c_1 through c_N and constants a_{i1} through a_{iN} according to the equation



$$w_i = \sum_{k=1}^{i} a_{ik} c_k;$$

means for squaring said resulting combined w_i term;

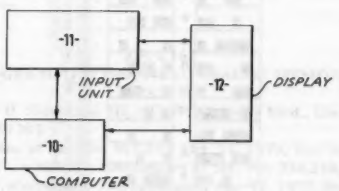
means for accumulating the resulting w_i^2 term as each of said N PCM samples are received;

second means for multiplying said accumulated samples by a set of fixed constants related to the covariance matrix with the resulting product representing the probability that the specific combination of audio frequencies was transmitted.

3,961,168
COMPUTER WITH MANUAL PARAMETER ENTRY MEANS

Thomas David Gaffney, Dundalk, Ireland, assignor to Oeleq Limited, Dundalk, Ireland

Filed Dec. 4, 1974, Ser. No. 529,635
Int. Cl.² G06F *3/02*, *15/46*
U.S. Cl. 235—152 **3 Claims**

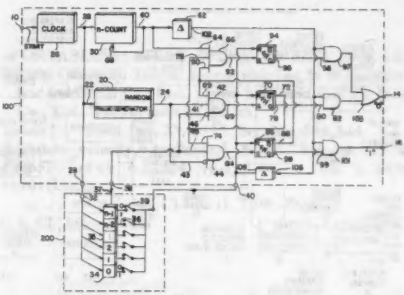


1. A computing system having a computing section for computing according to a predetermined programme, an input unit coupled to feed information into said computing section and a display unit coupled to said computing section to display information contained therein, and wherein said input unit includes means to apply to said computing section quantities representative of the initial conditions of variables of said information, manually-actuable means for varying the value of the quantity representing a designated variable from its initial condition, electronic circuitry for generating a train of pulses, said manually-actuable means comprising a manually rotatable element arranged to operate said electronic circuitry to generate a train of pulses to vary said value, and an up/down counter arranged to receive said train of pulses and the value of said designated variable and to output an altered value thereof.

3,961,169
BIASED-BIT GENERATOR

Walton B. Bishop, and John M. Hovey, both of Oxon Hill, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 25, 1975, Ser. No. 561,967
Int. Cl.² G06F 7/38
U.S. Cl. 235—152 **5 Claims**



1. A biased-bit generator comprising:

means for generating a series of random *n*-bit binary numbers Y;

means for generating a series of desired *n*-bit fixed-value binary numbers B, the value of B being indicative of a desired probability value and the binary Y and B groups being synchronized;

means connected to the outputs of both aforesaid means for determining the relative magnitude between said numbers B and Y in each time-corresponding set, and for generating a relative magnitude indication signal;

means connected to said relative magnitude determining and indicating means for generating a binary 1 when said indication signal indicates that a number Y is less that its associated set-number B, and for generating a binary 0 when said indication signal indicates that a number Y is greater than or equal to its associated set-number B,

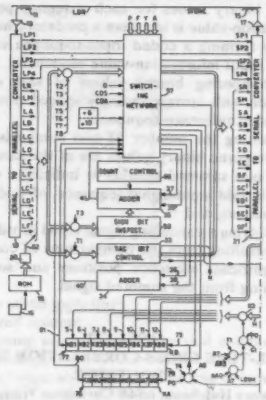
whereby said binary 1 s and 0 s are generated so that on the average the ratio of the number of 1 s to 0 s + 1 s is essentially equal to $(B/2^n)$.

3,961,170
FIXED POINT TO FLOATING POINT CONVERSION IN AN ELECTRONIC COMPUTER

Giovanni De Sandre, Brugherio (Milan); Angelo Subrizi, Ivrea (Turin), and Franco Bretti, Are' Di Caluso (Turin), all of Italy, assignors to Ing. C. Olivetti & C., S.p.A., Ivrea (Turin), Italy

Continuation of Ser. No. 246,735, April 24, 1972, Pat. No. 3,828,322. This application Apr. 17, 1974, Ser. No. 461,558
Claims priority, application Italy, Apr. 22, 1971, 68336/71
Int. Cl.² G06F 5/02
U.S. Cl. 235—154 **1 Claim**

1. In a digital electronic computer comprising: a memory including a first and a second register, the first register receptive of a number to be converted from fixed to floating point notation, the second register receptive of a significant zero digit associated with a decimal point; shifting means selectively operable too shift the contents of either of said registers; aligning means operable to control said shifting means to first shift the content of said second register until the decimal point stored therein is aligned with the decimal point stored in said first register; indicating means for indicating whether the number stored in said first register is greater or less than one; and control means responsive to said indicating means to control said shifting means to next shift the contents of one of said registers when said number is greater than one and alternatively to shift the contents of the other of said registers when said number is less than one, said control means including means for detecting the highest significant digit of the digits of said first register to stop said shifting means when the decimal point of said second register is aligned with the location of the next higher order with respect to the highest significant digit

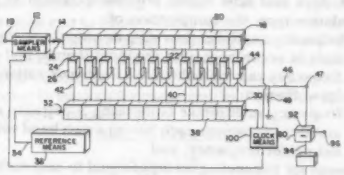


of said first register, and counting means responsive to said shifting means to effect said second register to be incremented or decremented by one in dependence upon the direction for each shifting, whereby the first register contains the mantissa and the second register contains the exponent of the floating point notation.

3,961,171
METHOD OF OBTAINING CORRELATION BETWEEN CERTAIN SELECTED SAMPLES OF A SEQUENCE

Jacob J. Freeman, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 18, 1975, Ser. No. 550,796
Int. Cl.² G06F 15/34
U.S. Cl. 235—181 **8 Claims**



1. A method for detecting, from among an input-sequence of information-values, a class of input information-value sequences comprising the steps of:

first, creating a reference information-sequence comprising a series of reference-values, each said reference value being contained in either a significant sequence-position or a non-significant sequence-position, and having a desired information content in each of said significant sequence-positions, and an arbitrary information content in each of said non-significant sequence-positions;

second, coding said reference information-sequence with a pair of identical binary ones for each sequence-position if said desired information content is greater than a predetermined threshold, a pair of binary zeroes for each sequence position if said desired information content is less than a predetermined threshold, and coding said arbitrary information content with a pair of complemen-

tary binary values for each sequence position, thereby forming a coded reference-sequence corresponding to said reference information sequence;

third, coding each said input information-value with a pair of binary ones for each sequence position if said information-value is greater than a predetermined threshold, a pair of binary zeroes for each sequence position if said information-value is less than a predetermined threshold, thereby forming a coded input-sequence corresponding to said input information-value sequence;

fourth, comparing binary values of said coded input-sequence with correspondingly spaced binary values of said coded reference-sequence;

fifth, summing the number of said comparisons in which said compared binary values are of the same value,

whereby said summed number is indicative of the occurrence, in said input-signal sequence, of said desired class of sequences; and

sixth, supplying a cancelling signal equal in value to the bias value resulting from the comparisons of coded signals in non-significant sequence positions and subtracting the cancelling from the summed signal.

3,961,172

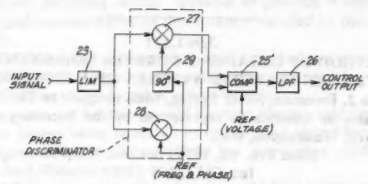
REAL-TIME CROSS-CORRELATION SIGNAL PROCESSOR

Robert Stewart Hutcheon, 6548 Covington Way, Goleta, Calif. 93017

Continuation-in-part of Ser. No. 421,502, Dec. 3, 1973, abandoned. This application Dec. 5, 1974, Ser. No. 529,759

Int. Cl.² G06G 7/19; H04B 1/10

U.S. Cl. 235—181 **40 Claims**



32. In a real time signal processing system of the cross correlation type, the combination of:

a frequency multiplier providing an output varying in amplitude in accordance with the input thereto and varying in frequency as a multiple of the frequency variations of the input thereto;

a frequency multiplexer comprising a plurality of parallel connected channels each having a pass band with a different center frequency; and

means for connecting an input signal to said multiplier and for connecting said multiplier and said multiplexer in series.

3,961,173

HEAT UNIT INTEGRATOR FOR X-RAY TUBES

John T. Perry, Salt Lake City, Utah, and Joel J. Schmutzer, Oak Park, Ill., assignors to Varian Associates, Palo Alto, Calif.

Filed Nov. 20, 1974, Ser. No. 525,423

Int. Cl.² G06G 7/56; H02H 5/04

U.S. Cl. 235—184 **11 Claims**

1. In apparatus for indicating the temperature of the target of an X-ray tube having a target and a cathode comprising;

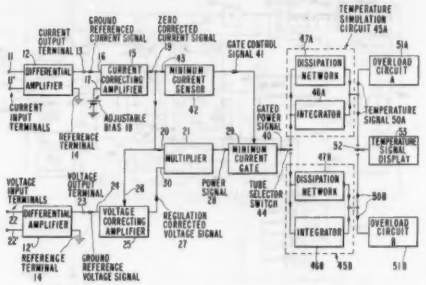
means for generating a power signal indicative of instantaneous power input to said target,

means for integrating said power signal with respect to time to generate a temperature signal indicative of the heat energy storage in said target,

means to dissipate said temperature signal simulating heat loss from said target,

said means for generating said power signal comprising a pair of input terminals for receiving therebetween an input voltage signal proportional to the target voltage between said cathode and said target,

a pair of input terminals for receiving an input current signal therebetween proportional to the electron current from said cathode to said target,



means for combining said input voltage and current signals to produce a power signal indicative of the product of said voltage and said current;

the improvement comprising differential amplifier means connected between at least one of said input terminals and said combining means, for converting said input signals to signals between a common reference terminal and single voltage and current terminals whereby errors in combining said signals are reduced.

3,961,174

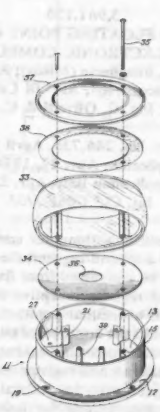
WARNING LIGHT APPARATUS FOR INDUSTRIAL VEHICLE USE

Arnold O. Blaylock, Fort Worth, Tex., assignor to Lectric Lite Company, Fort Worth, Tex.

Filed June 9, 1975, Ser. No. 585,089

Int. Cl.² B60Q 1/26, 3/02; F21S 1/02

U.S. Cl. 240—8.18 **5 Claims**



1. An improved warning light apparatus for industrial vehicle use having an intermittently flashing high intensity light and circuit means enclosed within a lens, the improvement comprising:

a transverse bottom plate;
a sidewall extending from the plate, for providing a support for the lens;
an annular flange adjacent the sidewall and plate for direct rigid coupling to the industrial vehicle; and
mounting means extending from the plate for mounting the high intensity light and circuit means;
said bottom plate, sidewall, mounting means and annular flange being formed in a solid integral piece.

3,961,175

PORTABLE BATTERY OPERATED ELECTRIC LIGHT

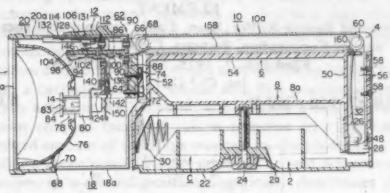
Hitoshi Otagoshi, Tokyo, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka and Aoki Electric Industrial Co., Ltd., Tokyo, both of, Japan

Filed Jan. 23, 1975, Ser. No. 543,344

Claims priority, application Japan, Feb. 4, 1974, 49-13865[U]; Feb. 6, 1974, 49-14678[U]; Feb. 7, 1974, 49-15101[U]

Int. Cl.² F21L 5/00, 7/00

U.S. Cl. 240—10.63 **14 Claims**



1. In a battery operated flashlight having a main body adapted to be gripped by an operator and to receive batteries therein and having contact means for engaging the terminals of batteries received therein, said main body having first and second ends, a head section including a socket for receiving a lamp, and interconnecting means interconnecting said main body and said head section; the improvement wherein said interconnecting means comprises arm means having one end pivoted to one end of said main body and another end pivoted to said head section whereby said head section may be moved to a position adjacent said other end of said body, said head section comprising:
a. a housing,
b. a first light transmitting window in said housing,
c. a substantially dome shaped reflector having a center hole, said reflector being in position in said housing behind said first window to reflect light out of said first window,
d. a second light transmitting window in said housing in a position behind said reflector,
e. externally controllable slide control means on said housing and having first and second end positions,
f. means connected to said slide control means for mounting said socket internally of said housing and aligned with said center hole of said reflector and behind said reflector, whereby said socket means moves in a direction axially of said reflector upon movement of said slide control means,
g. a light shielding cap substantially the same size as said central hole of said reflector,
h. means mounting said cap member for axial movement of said reflector with said socket, whereby said cap is positioned in said hole for blocking passage of light in said first end position of said control means and is positioned within said reflector in the second end position of said control means, and
i. switch means in said housing connected to said socket, and circuit means connecting said switch means to said contact means.

3,961,176

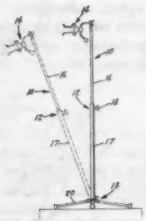
ADJUSTABLE LAMP STAND

Lawrence E. Gleason, 140 Hackberry Hill, Long Lake, Minn. 55356

Filed Apr. 26, 1972, Ser. No. 247,784

Int. Cl.² F21S 1/12; F16M 11/38

U.S. Cl. 240—81 BC **9 Claims**



1. A lamp stand including:
an elongated column;
lamp retaining means disposed on said column adapted to retain a lamp;
base means disposed on one end of said column to support the column;
said base means including a plurality of outwardly extended legs, each said leg being independently and individually pivotally connected at one end thereof to said column by a continuous brake friction joint, each leg being frictionally restrained in an outwardly extended position to support the column and pivotally movable relative to the column upon application of manual force whereby the column is adjustable to any preselected angular position relative to the base;
said column including a shaft member and a hollow tubular pole member having a first open end;
said shaft member telescopically engageable with the pole member in the first open end thereof;
said lamp retaining means disposed on said shaft member adapted to releasably retain a portable lamp;
said base means disposed on said pole member;
first releasable securing means to secure the shaft member in telescopic engagement with the pole member;
said pole member having a second open end opposite the first open end to telescopically receive the shaft member, said shaft member being removable from the first open end and insertable in the second open end; and including second releasable securing means to secure the shaft member in telescopic engagement in the second open end of the pole member.

3,961,177

AUTOMATIC FOCUSING OF OPTICAL IMAGES

Jerry L. Hatchett, Xenia, Ohio, assignor to Goodyear Aerospace Corporation, Akron, Ohio

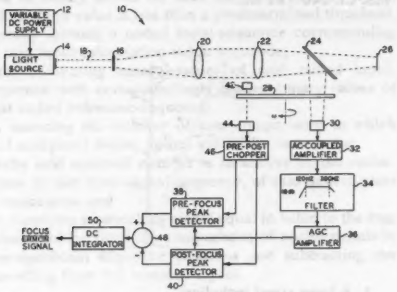
Filed July 31, 1974, Ser. No. 493,282

Int. Cl.² G01J 1/36

U.S. Cl. 250—201 **7 Claims**

1. In an image projection system having a light source for projecting an image bearing beam upon an image plane, the improvement of an automatic focusing device, comprising:
a beam splitter interposed within said image bearing beam and deflecting a portion of said beam;
a photoconductor receiving the deflected portion of said beam and creating signals indicative of image clarity;
a transparent rotating disk divided into at least two sections of different focus delay characteristics interposed between the beam splitter and the photoconductor; and
first and second signal detector circuits receiving circuits from the photoconductor, the first signal detector receiving the signals when light incident to the photoconductor

is received through a first section of the rotating disk and the second signal detector receiving the signals when light incident to the photoconductor is received through a second section of the rotating disk, the detector circuits being connected to a summing circuit producing an output indicative of the relative amplitudes of the signals incident to the signal detector circuits, the transmission of signals to the respective signal detectors being controlled by a chopper circuit receiving signals from synchronized pulse markers on the rotating disk.



3,961,178

IMAGE SHARPNESS DETECTING SYSTEM AND APPARATUS UTILIZING THE SAME

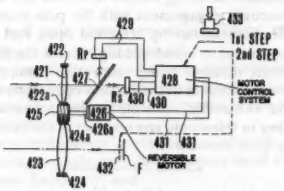
Kazuya Hosoe; Hiroshi Aizawa, both of Machida; Seiichi Matsumoto, Yokohama, and Hideo Yokota, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 18, 1974, Ser. No. 515,849

Claims priority, application Japan, Oct. 23, 1973, 48-119281

Int. Cl.² G01J *1/20*; H01J *39/12*

U.S. Cl. 250—201 **16 Claims**



1. An image sharpness detecting system cooperating with an image-forming optical system to detect an optimum degree of sharpness of an image projected thereby from an object comprising:

light-to-electrical signal converting means positioned at a point of substantial focus of said optical system;

detecting means connected to the output of said light-to-electrical signal converting means upon variation of the electrical output signal for detecting an optimum degree of sharpness of an image of the object;

said light-to-electrical signal converting means including:

first photoconductive means having an electrical characteristic associated therewith, said means having at least a pair of electrodes and a photoconductive element of such a geometry as to establish a current path of wide width and short length with the photoconductive material sandwiched in between said electrodes along the respective entire wide widths of said element,

second conductive means having an electrical characteristic associated therewith, said means having at least a pair of electrodes and a photoconductive element of such a geometry as to establish a current path of narrow width and long length with the photoconductive material sandwiched in between said electrodes along the respective entire narrow widths of said element; said electrical characteristic of both first and second photoconductive means having a peak value when the sharpness of the image to be formed thereon becomes maximum; and

optical means arranged between said first and second photoconductive means for adjusting the ratio of total incident light intensities on the surface of said two means so as to compensate for differences between the resulting lightresponsive characteristics of said first and second photoconductive means, whereby the optimum degree of sharpness of the image of the object which may be encountered can be detected with high accuracy even at low light levels.

3,961,179

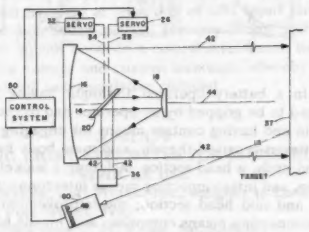
BEAM DIRECTING SYSTEM HAVING A MOVEABLE LOW MASS INERTIA BEAM FOLDING OPTICAL ELEMENT

Fernand Bannie Kuffer, Brea, Calif., assignor to General Dynamics Corporation, Pomona, Calif.

Filed Feb. 7, 1975, Ser. No. 547,901

Int. Cl.² G01J *1/20*

U.S. Cl. 250—203 R **8 Claims**



1. A low mass inertia optical system for accurately directing a radiation beam in a given direction which comprises:

optical beam folding means for diverting and folding incident radiation beams about a primary optic axis of the system,

said means including a secondary optical member disposed generally perpendicular to said primary optic axis and operative to divert incoming radiation beams to generally parallel to said primary optic axis and outgoing radiation beams away from said primary optic axis,

a primary optical member disposed generally perpendicular to said primary optic axis and in a radiation beam exchanging relation with respect to said secondary optical member and operative to divert incoming radiation beams toward said secondary optical member and outgoing radiation beams to generally parallel to said primary optic axis,

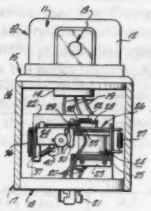
and a beam director member mounted for pivotal and rotational movement about associated axes to accommodate radiation beam direction changes, said beam director is disposed between said primary and secondary optical members in a radiation beam exchanging relationship with said secondary optical member to fold incoming and outgoing radiation beams, said beam director is adapted to divert outgoing radiation beams parallel to said primary optical axis for interception by said secondary optical member, and said beam director member diverting incoming radiation beams to generally perpendicular to said primary optical axis.

3,961,180

LUMINAIRE DURATION CONTROL

Frank H. Schultz, 329 Knight Way, La Canada, Calif. 91011

Filed Feb. 4, 1974, Ser. No. 439,447
Int. Cl.² H01J 39/12
U.S. Cl. 250—206 18 Claims



8. A luminaire duration control device for a luminaire having a photoelectric actuating device comprising:

a housing mechanically connected to the photoelectric actuating device and providing an electrical connection therefor at a first portion, and providing an electrical connection to the luminaire at a second portion;

duration control means mounted in said housing and including a carriage member which, in a first position electrically activates the luminaire and initiates a delay mechanism coupled therewith, all in response to a predetermined amount of radiation received by the photocell, and after a predetermined delay provided by said delay mechanism, in a second position electrically deactivates the luminaire and said delay mechanism; and

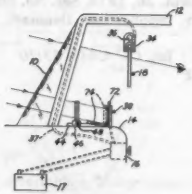
first means disposed in said housing, and electrically coupled to the actuating device for positioning said carriage member in the first position in response to a predetermined amount of radiation received by the photocell.

3,961,181

EYE-SHADING MEANS FOR AUTOMOTIVE VEHICLE OPERATORS

Eddie R. Golden, 12812 Erwin St., North Hollywood, Calif. 91606

Filed Feb. 18, 1975, Ser. No. 550,213
Int. Cl.² G02F 1/13; H01J 39/12
U.S. Cl. 250—208 8 Claims



1. A structure for individually but simultaneously shading the eyes of a vehicle driver against the blinding effect of the sun and of approaching vehicle headlights, consisting of

a. a linear eye-shading screen composed of a series of contiguous, normally transparent but electrically darkenable zones adapted to be situated between the driver's eyes and the sun, each such zone being wide enough when darkened, effectively to obviate the glaring effect of the sun upon one eye of the driver,

b. a linear array of contiguous photosensitive sensor cells equal in number to the number of electrically darkenable zones of the eye-shading screen and disposed physically in parallelism with the eye-shading screen and in positions in which they may be exposed to the sun and to approaching headlights,

c. sensor shielding means located in front of the array of sensor cells in position selectively to differentiate uniformly spaced sensor cells and uniformly spaced pairs of adjacent sensor cells from the remainder of the sensor cells as to shading, and

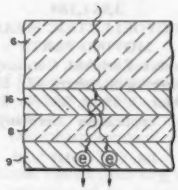
d. electrical control means electrically cross-associating individual sensor cells of the sensor cell array and individual electrically darkenable zones of the eye-shading screen in such manner that the differentiated electrically darkenable zones of the eye-shading screen will be selectively darkened to shade the respective eyes of the driver.

3,961,182

PICK UP SCREENS FOR X-RAY IMAGE INTENSIFIER TUBES EMPLOYING EVAPORATED ACTIVATED SCINTILLATOR LAYER

William E. Spicer, Stanford, Calif., assignor to Varian Associates, Palo Alto, Calif.

Division of Ser. No. 7,358, Feb. 3, 1970, Pat. No. 3,795,531, which is a continuation of Ser. No. 606,514, Dec. 22, 1966, abandoned. This application Aug. 18, 1972, Ser. No. 281,905
Int. Cl.² H01J 31/50
U.S. Cl. 250—213 VT 7 Claims



1. An evacuated x-ray image intensifier tube of improved conversion efficiency and resolution comprising:

evacuated envelope means;

an x-ray pick-up screen disposed within said evacuated envelope means for receiving an x-ray image and converting said x-ray image by scintillation into an optical photon image corresponding to the received x-ray image,

said x-ray pick-up screen comprising a vacuum vapor deposited polycrystalline layer of alkali metal halide scintillator material, said scintillator material including an activator so as to be x-ray sensitive and selected from the group consisting of CsI, NaI, LiI, KI, CsBr, and RbI, having a density of alkali metal halide material approximately equal to that of the bulk alkali halide material, and having a thickness greater than 0.0005 inch; and

a photocathode layer behind said x-ray pick-up screen for converting said photon image to a corresponding electron image for emission into said evacuated envelope.

3,961,183

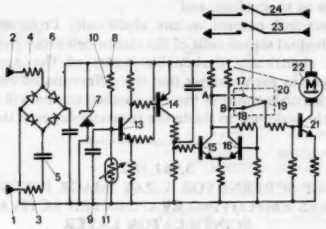
LIGHT-RESPONSIVE ELECTRIC SWITCH

Guy Dubot, and Jacques Lemercier, both of Saverne (Bas-Rhine), France, assignors to Fabrique d'Horlogerie la Vedette S.A., Saverne, France

Filed Feb. 3, 1975, Ser. No. 546,751
Claims priority, application France, Feb. 8, 1974, 74.04759
Int. Cl.² H01J 39/12; H05B 37/02; H01H 47/24
U.S. Cl. 250—214 R 5 Claims

1. A light-responsive electric switch, comprising an electronic circuit, means to supply direct current to said circuit, said circuit comprising a voltage divider comprising a fixed resistor and a variable resistor forming a photo-conductive cell, transistors which are blocked or rendered conductive according to the illumination of the photo-conductive cell, a

further transistor, a changeover switch transmitting voltage from the first-mentioned transistors to said further transistor, said further transistor having a collector circuit, a motor connected in the collector circuit of said further transistor, said



motor having an output shaft having a pinion fixed thereon, step-down gearing meshing with said pinion, cam means rotatable with the final pinion of said step-down gearing, and at least one contact engageable with said cam means for opening and closing at least one lighting circuit.

3,961,184

DEVICE FOR PHOTOELECTRIC MEASUREMENTS OF MOVING PARTS

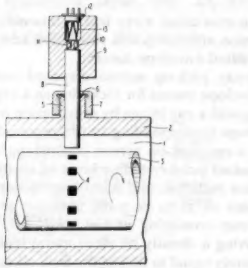
Josef Schurrer, Munich-Karlsfeld, Germany, assignor to Maschinenfabrik Augsburg-Nurnberg AG, Germany

Filed Mar. 3, 1972, Ser. No. 231,489

Claims priority, application Germany, Mar. 3, 1971, 2110017

Int. Cl.² G01D *5/30*

U.S. Cl. 250—231 R **19 Claims**



1. Apparatus for photoelectrical measurements of a movable part having contrast marks provided thereon comprising a photoelectric scanning means having a housing, said scanning means including a light source means and a light detecting means arranged within the housing, and a single light conductive means having said scanning means arranged at one end face thereof and another end face thereof being arranged in the region of the contrast marks on the movable part, said single light conductive means forming a beam path for directing light from the light source to the movable part and for directing reflected light from the movable part to the light detector, said single light conductive means including at least one light conducting member having a center line extending between opposite end faces of said member, substantially all parts of said member being arranged for simultaneously transmitting light from the light source to the movable part and reflected light from the movable part to the light detector in respective opposite directions through said member and the opposite end faces thereof.

3,961,185

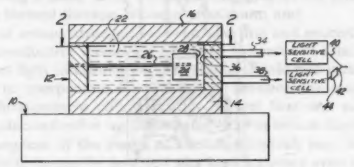
FIBER OPTIC DISPLACEMENT TRANSDUCER

Robert E. Brokenshire, Troy, and Robert G. Pratt, Farmington Hills, both of Mich., assignors to The Detroit Edison Company, Detroit, Mich.

Filed Nov. 11, 1974, Ser. No. 522,418

Int. Cl.² G01D *5/34*

U.S. Cl. 250—231 R **25 Claims**



1. A fiber optic vibration displacement transducer for use in a hazardous area comprising a support, a body, seismically isolating means mounting said body on said support for movement relative thereto, said seismically isolating means being effective to provide for vibratory movement of said support while preventing movement of said body to provide relative movement between said support and body substantially equal in magnitude and frequency to vibratory movement of said support, a light reflecting target surface on said body, a first non-coherent fiber optic bundle fixedly mounted on said support for vibratory movement therewith and having a light emitting end adjacent and confronting at least a part of said reflecting surface, a second non-coherent fiber optic bundle also fixedly mounted on said support for vibratory movement therewith and having a light receiving end positioned adjacent the light emitting end of said first bundle, and adjacent and confronting at least a part of said reflecting surface to receive from said surface an amount of reflected light variable in accordance with the position of said target surface relative to said bundle ends, a light source for directing light into said first bundle, and light sensing means positioned to receive light from said second bundle and to produce a signal indicative of a characteristic of the vibration.

3,961,186

METHOD AND APPARATUS FOR THE DETERMINATION OF ELECTRON DENSITY IN A PART VOLUME OF A BODY

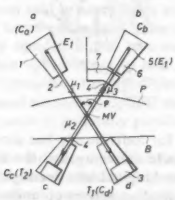
Ib Leunbach, Birkholmvej 29, 2720 Vanlose, Denmark

Filed Sept. 26, 1974, Ser. No. 509,514

Claims priority, application Denmark, Oct. 9, 1973, 5473/73

Int. Cl.² G01N *23/20*

U.S. Cl. 250—272 **9 Claims**



1. A method for the determination of the electron density of desired small volumes, called the measuring volume, of a body comprising the steps of directing a first beam of ionizing radiation through said measuring volume to penetrate said volume in a first direction, said first beam having an intensity I_0; measuring extra-corporally the intensity of the primary radiation and the intensity of scattered radiation in a second direction of the radiation of said first beam transmitted

through said volume, said second direction forming an angle ϕ to said first direction; directing a second beam of ionizing radiation substantially of said intensity I_0 through said volume in said second direction; measuring extra-corporally the intensity of the primary radiation and the scattered radiation in said first direction of the radiation of said second beam transmitted through said volume in said second direction, employing such high energy radiation that the Compton effect will be the wholly dominant absorption phenomenon in said volume and in the radiation paths in said first and second direction, and that the change in the absorption cross-section from primary to secondary radiation caused by the Compton shift will be substantial; and employing the values of said measured intensities to calculate the electron density of said measuring volume in accordance with the formula:

$$n = K\left[C_c \cdot C_d\right]^{\frac{\mu_1+\mu_3}{2(\mu_2+\mu_3)}} \left[\frac{A_0^2}{T_1 \cdot T_2}\right]^{\frac{\mu_3(\mu_1+\mu_2)}{2\mu_1(\mu_2+\mu_3)}} \left[A_0\right]^{-1}$$

where

n = electron density

K = a calibration constant

μ_1 = the total linear attenuation coefficient for primary radiation

μ_2 = the total linear attenuation coefficient for Compton radiation "forwards"

μ_3 = the total linear attenuation coefficient for compton radiation "backwards"

A_o = arbitrary expression for the power of the radiation source

C_c = measure of Compton radiation

C_d = measure of Compton radiation

T_1 = measure of Transmitted Radiation

T_2 = measure of Transmitted Radiation.

3,961,187

REMOTE SENSING OF MARINE HYDROCARBON SEEPS

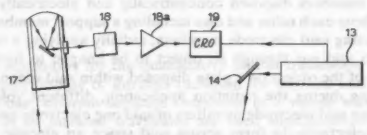
Anthony Rene Barringer, Willowdale, Canada, assignor to Barringer Research Limited, Rexdale, Canada

Filed Nov. 1, 1974, Ser. No. 520,527

Claims priority, application United Kingdom, Nov. 6, 1973, 51428/73

Int. Cl.² G01N *21/38*

U.S. Cl. 250—301 **5 Claims**



1. A method of determining the presence of hydrocarbon seeps in the sea, comprising:

a. traversing an area of the sea in a moving vehicle,

b. generating a beam of primary light radiation and directing said light beam towards the sea, said beam being of sufficient intensity and of such wavelength composition to produce secondary light radiation in subsurface zones of the sea, said secondary radiation being observable in the vehicle, said zones being located near the surface of the sea,

c. receiving secondary light radiation emanating from said zones, and separating said received secondary light radiation into a first component attributable to radiation emanating from beneath the surface of the sea and a second component comprising the remainder of the received radiation,

d. determining the intensity of said first component of said received secondary light radiation,

e. observing the positions in said area wherein said secondary light radiation was received, and

f. repeating the aforesaid steps (*b*) – (*e*).

3,961,188

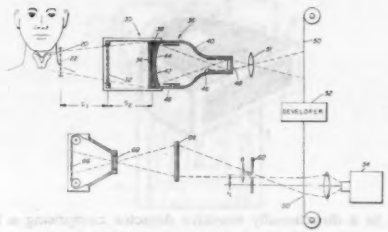
HIGH INTENSITY RADIATION IMAGING SYSTEM

Harrison H. Barrett, Lexington, Mass., assignor to Raytheon Company, Lexington, Mass.

Division of Ser. No. 250,224, May 4, 1972, Pat. No. 3,829,688. This application July 29, 1974, Ser. No. 492,815

Int. Cl.² G01T *1/161*

U.S. Cl. 250—303 **5 Claims**



1. The method of forming an image of the locations of a radiopharmaceutical introduced into a body of living tissue comprising the steps of:

introducing said radiopharmaceutical into said body of living tissue;

deriving informational signals from said high energy particles which are indicative of the location of emission of said particles from said body which have a spatial reference code having a varying periodicity portion and a substantially constant periodicity portion; and

deriving from said signals an image of the points in said body of living tissue from which said high energy particles have emanated.

3,961,189

DEVICE FOR MONITORING ACTIVITY OF GASES

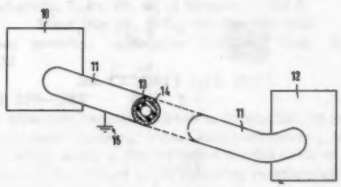
Sigwart Hiller, Lauf, and Harald Schad, Furth, both of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mulheim (Ruhr), Germany

Filed June 3, 1974, Ser. No. 475,930

Claims priority, application Germany, June 19, 1973, 2331209

Int. Cl.² G01N *31/00*

U.S. Cl. 250—304 **1 Claim**



1. Device for monitoring activity of gases in nuclear engineering installations, especially for metrologically registering iodine contained in exhaust air, the device comprising gas-withdrawing lines, and a common measuring and evaluating station to which said gas-withdrawing lines are connected, said gas-withdrawing lines being formed of polytetrafluorethylene

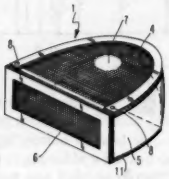
and being surrounded by a grounded metal jacket to prevent deposition of radioactive material from said gases on the inner surface of said gas-withdrawing lines.

3,961,190

VOLTAGE CONTRAST DETECTOR FOR A SCANNING ELECTRON BEAM INSTRUMENT

George V. Lukianoff, Hopewell Junction, and Theodore R. Touw, Poughkeepsie, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 6, 1975, Ser. No. 556,044
Int. Cl.² G01M 23/03
U.S. Cl. 250—310 17 Claims



1. In a directionally sensitive detector comprising a first major surface which includes an upper grid having an aperture for admitting a primary beam of electrons, a second major surface having a second aperture axially aligned with said first aperture for admitting secondary electrons from a specimen and a front grid partially defined the enclosure between said major surfaces, the improvement wherein:

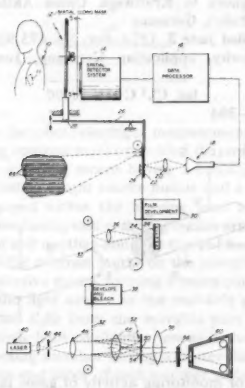
at least the portion of said major surfaces containing said apertures are in non-parallel arrangement with each other.

3,961,191

CODED IMAGING SYSTEMS

William W. Stoner, Watertown; David T. Wilson, Billerica, and Harrison H. Barrett, Lexington, all of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed June 26, 1974, Ser. No. 483,273
Int. Cl.² G03C 9/00
U.S. Cl. 250—312 15 Claims



1. A method of obtaining imaging data of a subject emitting radiant energy comprising the steps of:

detecting said radiant energy by means of a detector of radiant energy;

modulating said radiant energy by means of a modulator having a pattern comprising regions relatively opaque to said radiant energy arranged in a pattern with regions relatively transparent to said radiant energy, said modulator facing a predetermined region of said subject and being positioned between said subject and said detector, each of said regions of said modulator being sufficiently thin relative to the distance between said subject and said detector to permit radiant energy emanating from spaced apart points of said subject to cast overlapping shadows of one of said opaque regions upon said detector;

positioning said opaque regions in a plurality of locations within said modulator while facing said predetermined region of said subject, said detector providing arrays of values of detected radiant energy wherein one of said arrays of values differs from a second of said arrays of values in accordance with the locations of said opaque regions; and

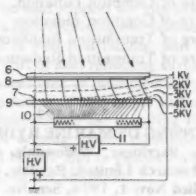
combining one of said arrays of values with a second of said arrays of values to obtain said imaging data.

3,961,192

IMAGE FORMATION METHOD

Yujiro Ando, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 8, 1974, Ser. No. 522,456
Claims priority, application Japan, Nov. 14, 1973, 48-128057
Int. Cl.² G03B 41/16
U.S. Cl. 250—315 R 8 Claims



1. An image forming process which comprises, filling a space formed between two electrodes with a gas, at least one of said two electrodes including a plurality of circular electrode members disposed concentrically and electrically isolated from each other and also including a support member for supporting said electrode members, radially applying a radiation to said gas through an object to be imaged to form an image of the object on a plate disposed within said space, and applying during the radiation application, different voltages between said electrode members of said one electrode and the other electrode to form across said space an electric field whose electric field lines extend substantially in the direction of the radiation passing through said space.

3,961,193

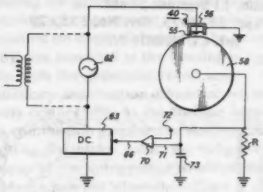
SELF ADJUSTING CORONA DEVICE

Frederick W. Hudson, West Henrietta, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 27, 1975, Ser. No. 581,382
Int. Cl.² H01T 19/24
U.S. Cl. 250—324 2 Claims

1. An arrangement for regulating the charging current deposited by a corona discharge device onto an imaging surface wherein said device includes a coronode, partially surrounded by a conductive shield comprising energizing means for applying corona generating A.C. signal to said coronode, bias means for superimposing a D.C. bias onto said coronode, control means for generating a signal representative of the

difference between said charging current delivered to said surface and a reference current, and bias control means for



varying said D.C. bias to thereby vary said charging current in response to said control signal.

3,961,194

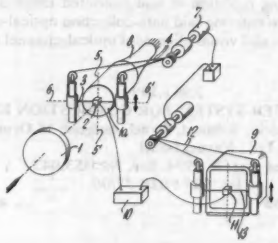
TRACKING AND DISPLAY APPARATUS FOR HEAT-DETECTING SYSTEMS

Karl-Heinz Simon, Oberkochen, and Hans-Richard Weinheimer, Koningsbronn, both of Germany, assignors to Carl Zeiss-Stiftung, Oberkochen, Germany

Filed Nov. 30, 1972, Ser. No. 311,904

Int. Cl.² H01J *31/49*

U.S. Cl. 250—334 **17 Claims**



1. Apparatus for the quantitative and/or qualitative detection and display of infrared radiation for daytime and nighttime use, wherein separate responses in a visible waveband and in an infrared waveband are used simultaneously in a single display, comprising optical means for imaging a field of view at an image surface; first means including a visible-waveband detector at said surface for visually displaying the visible-waveband response to said field at a display surface; second means including a scanning system with an infrared-sensitive detector element responsive to a part of said field near said image surface, for generating an electrical signal in accordance with scan action in said image surface; scan-tracking means tracking instantaneous scan action within the image surface; said display means including means responsive to said electrical signal for locally enhancing the visible character of the visible-waveband display at the display surface in accordance with the instantaneous magnitude of infrared response; and a synchronizing connection from said scan-tracking means and coordinated with the field display at said display surface for effectively superposing, upon said visible-waveband display, the infrared-responsive local visually enhanced modulation in accordance with instantaneous scan location within said image surface.

3,961,195

FIRE DETECTOR HAVING MEANS FOR HEATING THE SUPPORT MEMBER OF AN ELECTRODE TO PREVENT FORMATION OF MOISTURE THEREON

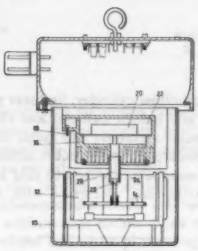
Timothy John Newington, 70 Greenfield Road, Greenside, Johannesburg, Transvaal, and Nicolaas Tjaart van der Walt, 33 Thomas St., Meredale, Johannesburg, Transvaal, both of South Africa

Filed Dec. 10, 1974, Ser. No. 531,346

Claims priority, application South Africa, Aug. 26, 1974, 74/5354

Int. Cl.² G01N *23/12*

U.S. Cl. 250—385 **2 Claims**



1. In a fire detector having a housing defining an ionization chamber, a support member of an electrically insulating material, an electrode supported in the ionization chamber by said support member and an electronic circuit to apply a voltage between the housing and the electrode and to detect variations in the resulting electrical current flowing through the ionization chamber, an improvement comprising a heat generating component of the electronic circuit, means mounting said heat generating component in a cavity formed in the support member between the electrode and the housing to heat that part of the support member surrounding the component in order to prevent the formation of moisture on that part thereby to prevent leakage currents flowing between the electrode and the housing via the support member.

3,961,196

MINIATURE IONIZATION CHAMBER

Viktor Ivanovich Alexeev, ulitsa Verkhnyaya Krasnoselskaya, 34, kv. 87; Ivan Yakovlevich Emelyanov, Kutuzovsky prospekt, 2/1, kv. 110; Vladimir Maximovich Ivanov, Golyanovskaya ulitsa, 7, korpus 1, kv. 12; Leonard Vasilievich Konstantinov, ulitsa Boitsovaya, 17, korpus 1, kv. 30; Boris Vasilievich Lysikov, Universitetsky prospekt, 21, korpus 1, kv. 8; Viktor Viktorovich Postnikov, ulitsa Perovskaya, 22, korpus 4, kv. 32, and Jury Viktorovich Rybakov, ulitsa Goncharova, 7, kv. 58, all of Moscow, U.S.S.R.

Filed July 30, 1974, Ser. No. 493,663

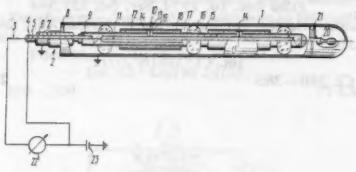
Claims priority, application U.S.S.R., Aug. 3, 1973, 1949732

Int. Cl.² G01T *1/18, 1/185*

U.S. Cl. 250—385 **6 Claims**

1. A miniature ionization chamber comprising, in combination: a grounded housing; a gas filling said housing; a lead-in to the housing made in the form of a triaxial cable secured in said housing, the triaxial cable including an intermediate and an outer coaxial conductor; a guard electrode for reducing ionization chamber leakage currents, the guard electrode accommodated in said housing and made in the form of a hollow cylinder electrically associated with said intermediate coaxial conductor of said triaxial cable; holes provided in said hollow cylinder; the triaxial cable further including a centre conductor; a collecting electrode accommodated in said housing; a metal rod forming part of said collecting electrode and disposed internally of said hollow cylinder and insulated there-

from, said rod being electrically connected to said centre conductor of said triaxial cable; tubular members also forming part of said collecting electrode, the surface whereof serves as the working surface of the collecting electrode, said tubular members embracing said hollow cylinder, being insulated therefrom, and spaced a certain distance apart along the



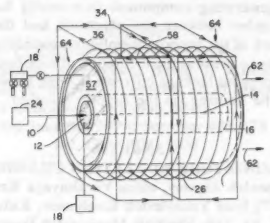
entire length of said hollow cylinder; jumpers passing through said holes made in said hollow cylinder and electrically interconnecting said tubular members and metal rod forming part of said collecting electrode; and spacers arranged intermediate of said tubular members, secured to said hollow cylinder, and affixing said collecting electrode with respect to said housing.

3,961,197

X-RAY GENERATOR

John M. Dawson, Los Angeles, Calif., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Aug. 21, 1974, Ser. No. 499,221
Int. Cl.² H01S 4/00; G21G 4/00
U.S. Cl. 250—493 **10 Claims**



1. Apparatus in combination with spark means for producing x-rays, consisting of:

a. a system of coaxial closed, inner and outer container means having concentric walls terminating in opposite ends along an equilibrium axis of rotation for gases having an atomic number Z greater and less than 10;

b. a first gas means in the inner container means having an atomic number Z less than 10;

c. a second gas mixture in the outer container means having respective atomic numbers Z greater and less than 10;

d. electromagnetic spark generating means for selectively producing an ionizing discharge of electromagnetic radiation in the form of a pulse of laser light in the gas in the inner container means to produce x-rays that pass axially through the inner container wall into the gas mixture in the outer container means for selectively ionizing one of the gases therein so as to produce a mixture of highly stripped and neutral atoms along the equilibrium axis in the outer container means for producing secondary x-rays along the equilibrium axis by an atomic process; and

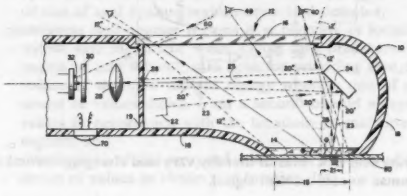
e. means for transmitting the secondary x-rays along the equilibrium axis from the ends of the container means.

3,961,198

VISUALLY ALIGNABLE SENSOR WAND WHICH EXCLUDES UNWANTED LIGHT FROM A SENSOR SYSTEM

Jack D. Aungst, Corona, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Apr. 28, 1975, Ser. No. 572,679
Int. Cl.² G06H 7/10
U.S. Cl. 250—566 **10 Claims**



1. A data collection wand comprising:

data-collection optical-channel means aligned to sense data within a data sensing field of view;

visual-alignment optical-channel means for providing an operator with a view of said data sensing field of view;

a source of data-sensing-radiation for illuminating said data to be sensed;

sensor means in said data-collection optical-channel means responsive to radiation of a restricted range of wavelengths for sensing radiation returned from data in said data sensing field of view; and

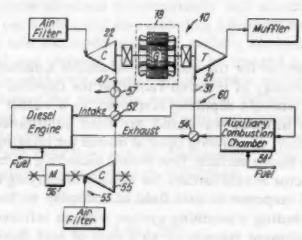
filter means in said visual-alignment optical-channel means for excluding radiation in said restricted range of wavelengths from entering said data-collection optical-channel means from said visual-alignment optical-channel means.

3,961,199

SUPERCHARGER SYSTEM FOR COMBUSTION ENGINE

Lucien Y. Bronicki, Rehovot, Israel, assignor to Ormat Turbines (1965) Ltd., Yavne, Israel

Filed Apr. 8, 1974, Ser. No. 453,043
Int. Cl.² F02B 37/00
U.S. Cl. 290—52 **4 Claims**



1. A supercharger system for a vehicle having an internal combustion engine comprising:

a shaft carrying a gas turbine rotor at one axial end and a centrifugal air compressor rotor at the other axial end; a pair of bearings mounting the shaft for rotation in a housing adapted to be attached to the vehicle;

the housing having at one axial end a turbine nozzle ring and a turbine exhaust ring cooperable with the turbine rotor, and having at the other axial end an axially located compressor inlet member and a radially located compressor outlet member cooperable with the compressor rotor;

the turbine nozzle ring adapted to be connected to the exhaust manifold of the engine and the compressor outlet member adapted to be connected to the intake manifold of the engine thereby supercharging the same;

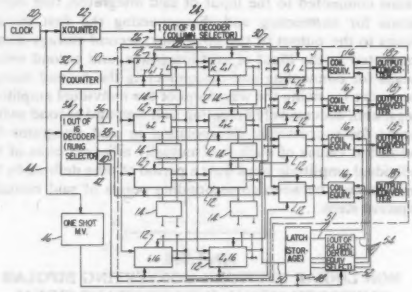
an electrical generator integrally incorporated into the housing for generating electrical power when the shaft is rotating, the generator comprising a generator rotor mounted on the shaft between the bearings, and a generator stator mounted in the housing in cooperative relationship with the generator rotor; and

an auxiliary combustion chamber whose output is selectively connectable to the turbine nozzle ring for furnishing combustion gases to the turbine rotor when the engine is idle, an intake valve for selectively connecting the output of the compressor to either the inlet of the combustion chamber when the engine is idle or to the intake manifold of the engine when the latter is running, and an auxiliary compressor for supplying start-up compressed air to the inlet of the combustion chamber until the main compressor produces a sufficient quantity of air to sustain operation of the turbine.

3,961,200
APPARATUS FOR CONSTRUCTING CONTROL CIRCUITS HAVING RELAY CIRCUIT FUNCTIONAL CHARACTERISTICS

John C Duté, 455 Hilldale Drive, Ann Arbor, Mich. 48105

Filed Sept. 6, 1973, Ser. No. 394,930
Int. Cl.² H03K 19/12
U.S. Cl. 307—112 23 Claims

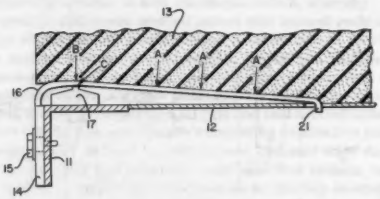


1. Apparatus for constructing relay-type control circuit equivalents comprising: at least a first solid-state, logic-level modular device representing a relay coil in circuit response; at least a second solid-state, logic level modular device representing relay contacts in circuit response; a prewired panel having terminal means for receiving said modular devices in selected patterns to establish continuous electrical circuits therethrough; input means for interfacing external signal devices, such as switches, with said modular devices so as to operatively connect said external signal devices in said continuous electrical circuits; output means for interfacing external power consuming devices with said modular devices so as to operatively connect said power consuming devices in said continuous electrical circuits whereby the conductive or nonconductive state of a given one of said continuous electrical circuits controls the application of power to a power consuming device, and controller means for selectively interconnecting first and second modular devices in said panel to provide a periodically updated master-slave relationship therebetween whereby the conductive state of contact equivalents in a given continuous electrical circuit may be controlled by the coil equivalent in another continuous electrical circuit.

3,961,201
PATIENT MONITORING

Morris H. Rosenthal, 182 Pond St., Sharon, Mass. 02067

Filed Sept. 6, 1974, Ser. No. 503,805
Int. Cl.² H01H 35/00
U.S. Cl. 307—116 10 Claims



1. Patient monitoring apparatus comprising,

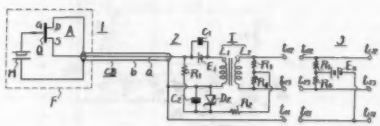
actuable contact means located near the edge of a bed frame beneath the mattress for actuation when a patient approaches the edge of the bed,

and switch arm means for actuating said contact means located between said mattress and said contact means for actuating said contact means when a patient approaches the edge of the bed while preventing said contact means from being actuated when the patient is away from the edge of the bed.

3,961,202
POWER SUPPLY CIRCUIT FOR USE WITH AN ELECTROSTATIC TRANSDUCER

Osamu Kono, Tokyo; Noboru Tsuchiya, Yokohama; Atsushi Matsuda, Tokyo, and Kiichi Yoshida, Warabi, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Nov. 13, 1974, Ser. No. 523,366
Claims priority, application Japan, Nov. 15, 1973, 48-131983[U]
Int. Cl.² H02J 7/00
U.S. Cl. 307—150 8 Claims



1. A power supply and output circuit for use with an electrostatic transducer having an amplifier, comprising:

a. an electrostatic transducer;

b. an amplifying device connected to said transducer;

c. a first circuit serving both as a power supply and an output circuit comprising first portable power means for supplying DC power to said amplifiying device, an output transformer for receiving a signal derived from said amplifier through said first power means, said transformer having primary and secondary windings, said primary winding being connected to said first power means and said secondary winding being connected to output terminals of said transformer;

d. a coaxial cable having a single central conductor and an outer conductor, said cable being connected between said amplifier and said first circuit;

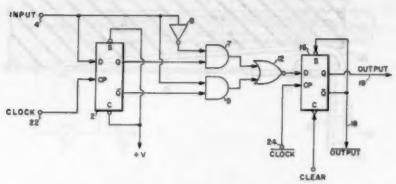
e. a second circuit serving both as a power supply and output circuit to be connected to said first circuit; and

f. resistor means connected between one of the conductors of said coaxial cable and output terminals of said transformer for serving as a DC power path when said second circuit is connected to said first circuit.

3,961,203
SIGNAL CORRELATOR

Frederick Hutch, Warminster, Pa., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jan. 9, 1975, Ser. No. 539,857
Int. Cl.² H03K 5/18
U.S. Cl. 307—236 5 Claims

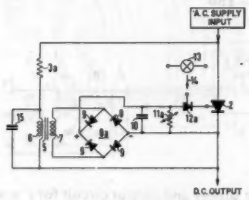


1. A correlator comprising:
an input signal receiving means for receiving pulse pair data signals,
flip-flop means for storing a first pulse of said pulse pairs, and
means for comparing a second pulse of said pulse pairs with said stored first pulse of said pulse pairs to detect the presence of an error in the received pulse pairs.

3,961,204
FIRING CIRCUIT FOR AN ELECTRIC VALVE

Karl-Friedrich Leowald, Weiher, and Jakob Schenk, Erlangen, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Nov. 29, 1974, Ser. No. 528,486
Claims priority, application Germany, Dec. 3, 1973, 2360173
Int. Cl.² H03K 17/60
U.S. Cl. 307—252 N 10 Claims

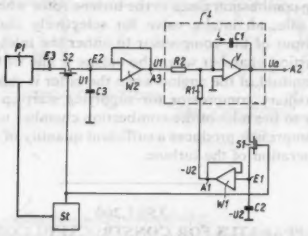


1. A firing circuit for an electric valve with at least three electrodes including an anode, a cathode and a control electrode, the control electrode along with one of the other electrodes forming a control path, said valve having an a.c. voltage at its anode-cathode path, comprising,
a series connected resistor and primary winding of a transformer in parallel with the anode-cathode path of said electric valve, so as to have an a.c. voltage impressed thereacross,
a rectifier connected to the secondary winding of said transformer, said rectifier having output terminals wherein a first terminal is at positive d.c. potential with respect to a second terminal, and where said second terminal is connected to the cathode of said electric valve,
a pulse capacitor connected in parallel across said first and second terminals of said rectifier,
switching means for discharging said capacitor through the control path of said electric valve, and
an auxiliary capacitor coupled in parallel across said primary winding of said transformer.

3,961,205
METHOD AND APPARATUS FOR OBTAINING A SIGNAL HAVING A LOW HARMONIC CONTENT

Gerd Kuligowski, and Eckart Cattien, both of Berlin, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Feb. 20, 1974, Ser. No. 444,124
Claims priority, application Germany, Feb. 23, 1973, 2309809
Int. Cl.² H03K 5/00
U.S. Cl. 307—261 10 Claims

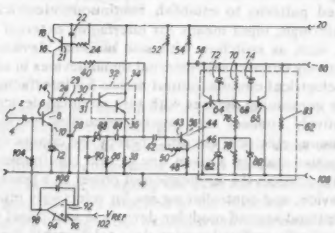


1. A method of obtaining a final signal of low harmonic content from a waveform approximating an original signal such as a measurement quantity or the like, the waveform consisting of individual amplitude steps one following the other, the method comprising: applying the waveform to a circuit arrangement including: an integrator, first storage means connected to the input of said integrator, first switch means for connecting and disconnecting the first storage means to the output of the integrator, second storage means connected to the input of said integrator, and second switch means for connecting and disconnecting the second storage means for receiving the waveform of the individual amplitude steps; and, successively actuating said first and second switch means for successively interpolating in said integrator between the values of each two mutually adjacent ones of the individual amplitude steps over a period of time defined by the time spacing between corresponding points of said mutually adjacent steps.

3,961,206
NON LINEAR NETWORK CONVERTING BIPOLAR SAWTOOTH SIGNAL INTO SINEWAVE SIGNAL

Hung Wah Anthony Lau, Fleet, England, assignor to The Solartron Electronic Group Limited, Farnborough, England

Filed Aug. 19, 1974, Ser. No. 498,814
Claims priority, application United Kingdom, Aug. 21, 1973, 39386/73
Int. Cl.² H03K 6/04
U.S. Cl. 307—261 11 Claims



1. A symmetrical non-linear two-terminal network for use in a function generator to convert a bipolar triangular wave of

predetermined amplitude into a sine wave, the network comprising

a first terminal,

a second terminal, first and second transistors each having an emitter, a collector and a base, the respective emitter-collector paths of the two transistors being connected in parallel with each other between the first terminal and the second terminal.

a first non-linear circuit coupled between the base and the collector of the first transistor, and

a second non-linear circuit coupled between the base and the collector of the second transistor, whereby one of the transistors becomes progressively more conductive as input signals of one polarity applied between the two terminals exceed a predetermined magnitude, and the other transistor becomes progressively more conductive as input signals of the other polarity applied between the two terminals exceed said predetermined magnitude,

each non-linear circuit comprises a respective diode adapted to conduct at a lower forward voltage than that of the base emitter junction of the respective transistor.

3,961,207

OUTPUT RETAINING ELECTRONIC CIRCUIT

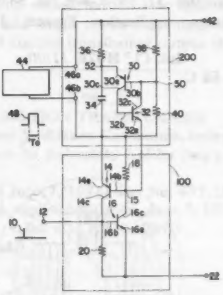
Hiroshi Minakuchi, Kadoma, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Japan

Filed Sept. 20, 1974, Ser. No. 507,805

Claims priority, application Japan, Sept. 25, 1973, 48-108170

Int. Cl.² H03K *3/284, 5/04, 1/18*

U.S. Cl. 307—273 **4 Claims**



1. An electronic circuit, for generating an output pulse having a predetermined duration in response to an input trigger pulse applied thereto, comprising:

an electronic switch comprised of a pair of complementary transistors wherein the base of each of said transistors is connected to the collector of the respective other one of said transistors, the base of a first of said transistors receiving in operation a trigger pulse to render said first transistor conductive to flow a collector current therethrough and thereby bias a second of said transistors to conduct and flow a collector current therethrough to bias said first transistor and maintain said first transistor in a conductive state after the termination of the trigger pulse; and

a pulse generator comprising a bridge circuit comprised of three resistors and a capacitor and having four nodes including a first node defined by the junction of said capacitor with a first of said resistors, a second node defined by the junction of said first resistor with a second of said resitors, a third node defined by the junction of said second resistor with the third of said resistors, and a fourth node defined by the junction of said capacitor and said third resistor, and a normally non-conductive control circuit having a pair of principal conduction electrodes and a control electrode, wherein a first of said conduction electrodes is connected to said first node, the second of said conduction electrodes is connected to the base of said second transistor in said electronic switch, and said control electrode is connected to said third node, and said fourth node is connected to the base and emitter of said second transistor in said electronic switch; whereby

a potential difference applied across said second node and the emitter of said first transistor is ineffective to develop a current through said electronic switch and said pulse generator when said first and said second transistors are nonconductive, a trigger pulse applied to the base of said first transistor rendering said first and said second transistors conductive and thereby completing conductive paths respectively defined by said second and said third resistors and said first transistor, and said first resistor, said capacitor and said second transistor to develop an output voltage between said second and said fourth nodes and to charge said capacitor, said capacitor charging to a certain potential value relative to the third node potential value thereby rendering said control circuit conductive between said pair of principal conduction electrodes to bias said second transistor to render said second and said first transistors non-conductive to terminate the current flow through said electronic switch and said pulse generator to reduce the output voltage to zero a predetermined time after the trigger pulse was applied.

3,961,208

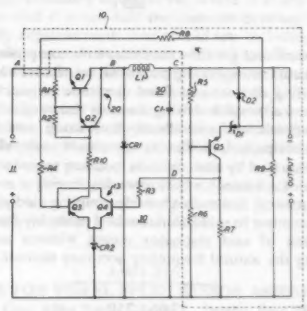
TEMPERATURE COMPENSATION FOR REGULATOR CIRCUIT

Rakesh Khanna, Parsippany, N.J., assignor to Litton Business Systems, Inc., Morris Plains, N.J.

Filed Feb. 11, 1974, Ser. No. 441,436

Int. Cl.² H03K *17/00, 1/12*

U.S. Cl. 307—297 **6 Claims**



1. A temperature compensation circuit adapted to be inserted between a source of input voltage and a load comprising:

transistor means having a predetermined value of voltage temperature coefficient between first and second electrodes thereof;

zener diode means connected in series to said first electrode;

said zener diode means having a value of zener breakdown voltage in a relatively low range;

said transistor means and zener diode means being coupled to said source;

said zener diode means comprising a pair of zener diodes connected in a back-to-back configuration to thereby provide a net voltage temperature coefficient value being the difference between the temperature coefficients of each of said diodes and to thereby also provide said zener

breakdown voltage value being the difference between the zener breakdown voltage values of each of said diodes;

said net temperature coefficient value also being opposite in algebraic sign and of the same magnitude as said transistor means voltage temperature coefficient value whereby, temperature compensation is achieved along the circuit path between said transistor means second electrode and including said zener diode means as a result of said net temperature coefficient value having the effect of cancelling said transistor means voltage temperature coefficient value during circuit operation, while permitting a value of zener breakdown voltage in said relatively low range.

3,961,209

OSCILLATOR FOR TIME MEASUREMENT

Karl Adler, Grenchen; Georges Ducommun, Feldbrunnen, and Charles A. Wantz, Grenchen, all of Switzerland, assignors to Biviator S.A., Grenchen, Switzerland

Continuation of Ser. No. 375,007, June 29, 1973, abandoned. This application Oct. 24, 1974, Ser. No. 517,760

Claims priority, application Switzerland, July 20, 1972, 10886/72

Int. Cl.² H02N *1/00*

U.S. Cl. 310—6 **18 Claims**

1. An oscillator for time measurement, comprising a source of direct current operating potential; an electrostatic oscillator including at least one fixed electrode connected to said source, and a movable driving member disposed adjacent said fixed electrode and periodically contacting said fixed electrode for reciprocal, oscillatory movement under electrostatic forces generated by such periodic contact; resonator means in the form of a balance wheel assembly having a natural resonant frequency; and means loosely coupling said electrostatic driving member to said balance wheel assembly for sustaining osciallation of said resonator means without substantially disturbing the natural frequency accuracy thereof.

3,961,210

PIEZOELECTRIC DOT RESONATOR DRIVEN AT A HARMONIC OVERTONE

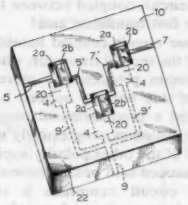
Takashi Nagata, Ikeda, Japan, and Raymond David Mindlin, Ridgefield, Conn., assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 352,646, April 19, 1973. This application Dec. 2, 1974, Ser. No. 528,869

Int. Cl.² H01L *41/04*, *41/18*

U.S. Cl. 310—9.5 **6 Claims**

1. A piezoelectric device comprising a thin plate of piezoelectric material having electrode regions and non-electrode regions on the major surfaces thereof and at least one pair of electrodes provided on said electrode region, said electrode regions having a thickness so as to vibrate in one of the harmonic overtones of the thickness-extensional mode at a preselected frequency when an electrical signal is applied to said pair of electrodes, the thickness of said non-electrode regions being greater than that of said electrode regions, the cut-off frequency of said harmonic overtone at said non-electrode regions being lower than the cut-off frequency of said harmonic overtone at said electrode regions, and the relation of said piezoelectric material and said harmonic overtone represented by $\{(\pi p/4)+4/k^2)\cot(\pi kp/2)\}$ being negative, where π



is a circular constant, p is a number of a harmonic overtone of the thickness-extensional mode (p=3,5 . . .), and k is a function of Poisson's ratio σ and is represented by $k=\{2(1-\sigma)/(1-2\sigma)\}^{1/2}$

3,961,211

GYROSCOPE MOTOR

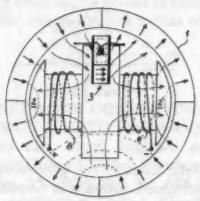
Jacques Vergues, Valence, France, assignor to Crouzet, Paris, France

Filed Dec. 31, 1974, Ser. No. 537,770

Claims priority, application France, Jan. 15, 1974, 74.01366

Int. Cl.² H02K *11/00*

U.S. Cl. 310—68 C **1 Claim**



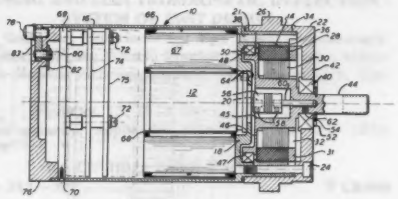
1. Gyroscope motor of the type comprising a magnetized rotor constituted by a permanent magnet in the shape of a toroid, within which are disposed the stator windings, the commutation being ensured by means of a static detector operating by variation of the impedance of a winding placed in the magnetic circuit, the saturation of said magnetic circuit being obtained directly by means of the field of the rotor; said detector comprising a miniature ferrite core circuit containing a coil, a rectangular-sided magnet of oriented ferrite, an armature of high permeability material comprising two rectangular strips connecting the magnet to the core circuit; said detector being disposed in such manner that its armatures are perpendicular to the surface of the rotor so as to act as a collector of the lines of force, and being in intimate contact with the driving coils of the motor, and the Curie point of its magnetic circuit being in the neighbourhood of 120°C so that it may serve as a safety thermostat.

3,961,212

INTEGRAL SERVOMECHANISM

Hugh P. McAdams, Jr., Drexel Hill, Pa., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed Dec. 23, 1974, Ser. No. 535,825
Int. Cl.² G05B 11/12; H02K 11/00
U.S. Cl. 310—68 R 9 Claims



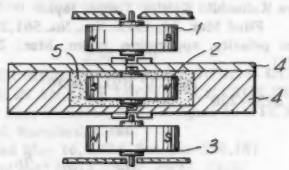
1. An integral servomechanism comprising:
a tubular cylindrical housing having a mounting flange partially closing one end;
control transformer means mounted within said housing on said mounting flange and having an output shaft extending through said partially closed end;
torque motor means including frame means externally mounted on said mounting flange and having stator means, rotor means and shaft means;
said shaft means having a bell-shaped cross section forming an internal hollow chamber; and
flexible coupling means mounted in said internal hollow chamber of said torque motor shaft means for joining said shaft to said control transformer output shaft.

3,961,213

MOTION TRANSFORMER

Kenichi Koike, and Yoshikazu Kawamura, both of Shimosuwa, Japan, assignors to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed June 7, 1974, Ser. No. 477,239
Claims priority, application Japan, June 7, 1973, 48-64079
Int. Cl.² H02K 49/10
U.S. Cl. 310—104 1 Claim



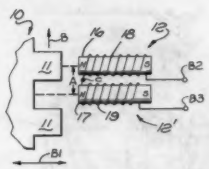
1. A rotary motion transformer comprising a permanent magnet driving member having two opposite polarity poles; a permanent magnet rotatable driven member having two opposite polarity poles, said driven member and driving member being disposed to define a flux field therebetween and rotate about the same axis; and a viscous damping means, said driven member being rotatably disposed in said viscous damping means, said driven member being continuously rotated in response to the intermittent rotation of said driving member and a rotatable following permanent magnet having two opposite polarity poles axially aligned with said driven magnet to define a flux field therebetween, said following magnet being continuously rotated in response to the rotation of said driven magnet.

3,961,214

VELOCITY PICK-OFF WITH NOISE CANCELLATION

Hendricus Johannes Lokkart, Arleta, Calif., assignor to International Telephone & Telegram Corporation, New York, N.Y.

Filed June 18, 1975, Ser. No. 588,015
Int. Cl.² H02K 21/38
U.S. Cl. 310—155 10 Claims



1. Apparatus for producing pulses at a repetition rate directly proportional to angular velocity, said apparatus comprising: a base; first and second magnetic pick-ups mounted in a fixed position relative to said base; a member, said member being rotatably mounted relative to said base about a first axis; a magnetic rotor fixed relative to said movable member in a position to move therewith contiguously past said pick-ups, said rotor having a set of equally and angularly spaced teeth separated by valleys, all of said teeth being located a predetermined distance from the rotational axis of said rotor, said first and second pick-ups including a set of first and second cores, respectively, the axes of said cores being approximately parallel to each other and to said first axis, said teeth projecting toward said cores in a direction approximately parallel to said first axis, said first and second cores having first and second coils therearound, the ends of said cores closest to said teeth being spaced apart in the direction of movement thereof a distance approximately equal to nd, where n is any positive odd integer and d is one-half the distance between any two immediately adjacent teeth, one of said sets including permanent magnets, one end of said first coil being connected to one end of said second coil at a junction adjacent to each, said permanent magnets being poled, and said coils having other ends and being wound in predetermined directions such that voltages induced in said coils at said other ends relative to said junction solely by rotation of said rotor are approximately out of phase, voltages induced in said coils at said other ends relative to said junction by vibration of said rotor back and forth in opposite directions along the said first axis being approximately in phase with each other.

3,961,215

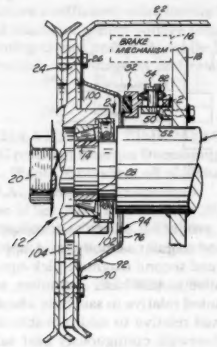
ROTOR FOR WHEEL SPEED SENSOR ASSEMBLY

Thomas A. Gee, Allen Park; Gerald L. Jacobs, Southfield, and Gunnar Baltare, Livonia, all of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Continuation of Ser. No. 427,562, Dec. 26, 1973. This application Feb. 3, 1975, Ser. No. 546,375
Int. Cl.² H02K 19/20
U.S. Cl. 310—168 3 Claims

1. A rotor for use in a wheel speed sensor for sensing angular rotation of a wheel support, said rotor having an axis of rotation and comprising a wall portion and a rotor face portion wherein said wall portion extends in an axial direction coaxially about said axis and said rotor face portion extends generally radially inward from said second edge portion, said wall portion further extending coaxially about said axis from a first annular edge portion to a second annular portion, said rotor face portion being cantilevered from said second edge portion and extending at an angle therefrom and terminating in a peripheral edge which coaxially surrounds said axis and which is axially spaced from said first annular edge portion, said rotor face portion having undulations formed therein

defining an annular array of equally spaced apart lands wherein adjacent lands are spaced apart from each other by a recess, said undulations being formed such that said lands and recesses extend for at least substantially the entire distance from said second annular edge to said peripheral edge, said recesses and lands extend toward said peripheral edge and terminate short thereof to define relatively a smooth



peripheral edge coaxial about said axis, said wall portion and said rotor face portion are integral and formed from material having a generally uniform thickness T, said recesses in said rotor face portion having a depth H, where H is on the order of T, the distance between said peripheral edge and said second edge portion is substantially greater than said material thickness T, and said wheel is provided with an axially extending escape hole for trapped oil and grease.

3,961,216

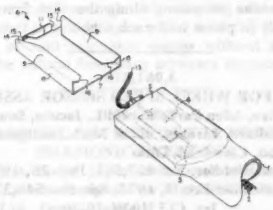
SHEET METAL BASE FOR PINCH SEALED ELECTRIC LAMP

Preston G. Edwards, Sagamore Hills, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Jan. 2, 1975, Ser. No. 537,856

Int. Cl.² H01J *5/48*

U.S. Cl. 313—51 **10 Claims**



1. A sheet metal base for a vitreous lamp envelope containing electric energy translation means and having a flat pinch seal at one end through which an inlead conductor connected to said translation means has a portion projecting externally, said base comprising:

a flat portion corresponding approximately in size to the flat side of said pinch seal,

longitudinally extending side wall portions exceeding in height the thickness of said pinch seal and having inwardly turned and downwardly inclined extensions adapted to resiliently engage the pinch seal,

and a distal end wall adapted to overlie the externally projecting portion of said inlead.

3,961,217

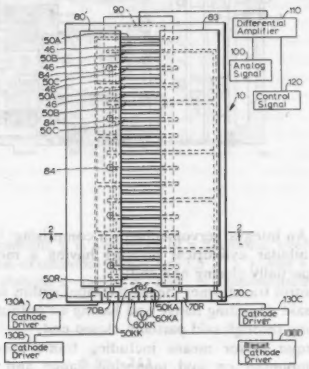
GASEOUS DISCHARGE DISPLAY PANEL HAVING TWO COLOR BAR DISPLAY

Myles E. Frischer, Hillsborough, N.J., assignor to Burroughs Corporation, Detroit, Mich.

Filed Feb. 24, 1975, Ser. No. 552,450

Int. Cl.² H01J *61/067, 61/30, 61/40*

U.S. Cl. 313—188 **19 Claims**



1. A display panel comprising an envelope having a viewing window,

first light-emitting means in said envelope adapted to emit light of one color, and second light-emitting means associated with said first means for generating light of a second color,

said first and second means together being able to generate a bar of light of predetermined length, the bar being made up of a first portion having said one color, determined by the energization of said first means, and a second portion of the second color,

said first portion of said one color and said portion of said second color together having said predetermined length.

3,961,218

SPACER FOR A DISCHARGE DISPLAY DEVICE

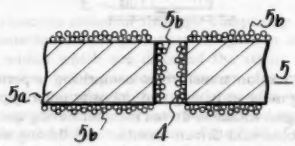
Satoshi Watanabe, Gyoda, Japan, assignor to Okaya Denki Sangyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 24, 1975, Ser. No. 561,299

Claims priority, application Japan, Mar. 25, 1974, 49-33808[U]

Int. Cl.² H01J *61/30*

U.S. Cl. 313—220 **5 Claims**



1. A discharge promotion member for discharge display device having spaced anodes and cathodes mounted within an envelope comprising:

a conductor plate mounted between said anodes and cathodes;

a plurality of apertures bored through said conductor plate;

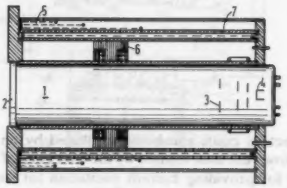
an insulating layer formed on the surface of said conductor plate;

said insulating layer being porous to electrons and ions, and an ionizing gas within said envelope so that the conductor plate with said insulating layer is located in a plasma space.

3,961,219
ELECTRON OPTICAL SYSTEM WITH A MAGNETIC FOCUSING AND ELECTROMAGNETIC DEFLECTION SYSTEM OF UNIT DESIGN

Martin Bechteler, Unterfoehring; Rolf Stock, Hohenschaeftlarn, and Wolfgang Welsch, Munich, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Oct. 15, 1974, Ser. No. 514,616
Claims priority, application Germany, Oct. 17, 1973, 2352119
Int. Cl.² H01J *31/48*; H01H *1/00*
U.S. Cl. 313—389 **9 Claims**



1. In an electron-optical system of the type having a magnetic focusing coil and an electromagnetic deflection system of unit design with a screening means between the focusing and deflection systems, and having a target for scanning by an electron beam and a fine-mesh field net arranged in front of the target and an aperture diaphragm spaced from the target adjacent the tube electron beam generating system, the improvement wherein:

the focusing coil has an increasing winding density in the direction from the aperture diaphragm toward the target, the deflection coils are of a length shorter than the focusing coil and adapted to be energized to provide a deflection field of less than about half the usual extent in the axial direction, whereby in association with the increasing focusing field strength toward the target and the deflection field, the electron beam experiences a rotation of less than 90° in the deflection field while achieving reducing reproduction at low impact errors.

3,961,220
SNUBBER MEANS FOR POSITIONING A GUN STRUCTURE IN AN ELECTRON DISCHARGE DEVICE

Donald LeRoy Say, Waterloo, N.Y., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed May 16, 1975, Ser. No. 578,181
Int. Cl.² H01J *29/02, 29/51, 29/92*
U.S. Cl. 313—417 **10 Claims**

1. In a cathode ray tube utilizing a multielectrode electron beam generating means employing a substantially cylindrical snubber positioning electrode accommodating the traversal of at least one electron beam and having a longitudinal axis therethrough, said generating means being oriented within a substantially cylindrical encompassing neck portion of the envelopic enclosure having minimum and maximum internal dimensions, means for effecting concentric positioning of said beam generating means within said neck portion comprising:

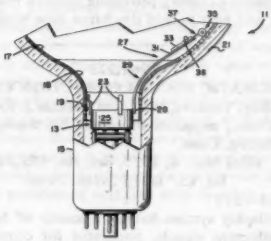
at least two electrical conductive snubber means in the form of similar longitudinal resilient metallic members fabricated of flat material and spatially positioned on said snubber positioning electrode, each of said snubber members having a central attachment portion formed in an arcuate manner to substantially conform to the circumferential surface of said positioning electrode whereon it is affixed in an orientation normal to said longitudinal axis, said attachment portion of each snubber means having like transition portions formed at each end thereof to provide like fulcra wherefrom similar first and second resilient lever arm portions extend in an opposed longitudinal manner, each of said lever portions having an integral contact element terminally formed thereon as a substantially spoon-shaped configuration having a convex

exterior surface oriented to make contact with said neck portion, each of said lever arms being positionally flexed from an as-formed relaxed position to a compressed position within said neck portion in a manner tangential to said cylindrical electrode to provide a like accommodating fulcrum therewith and thence effect similar increased pressured placement of each respective integral contact element against the interior surface of the encompassing neck portion.

3,961,221
ELONGATED GETTER SUPPORT FOR CATHODE RAY TUBE HAVING ROTATABLE MEMBER AT END

David Benda, Geneva, and Charles Alfred Davis, Auburn, both of N.Y., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed June 12, 1975, Ser. No. 586,194
Int. Cl.² H01J *29/94*; H01K *1/52*
U.S. Cl. 313—481 **8 Claims**



1. In a cathode ray tube having an envelopic enclosure formed of an integration of neck, funnel and panel portions and incorporating an electron gun structure within said neck portion in a manner oriented to beam electrons to a cathodoluminescent screen disposed on said panel portion, means for supporting a container of effusive material within substantially the funnel portion of said envelope comprising:

an antenna-type longitudinal positioning member having first and second ends, said first end being attached to said electron gun structure with the second end thereof having said container located thereat;

at least one support placement means projecting forwardly from said container as a directional continuation of said positioning member, said placement means having a rod-like axle portion formed normal to the directional

orientation of said positioning member being in a plane related to the bottom of said container; and

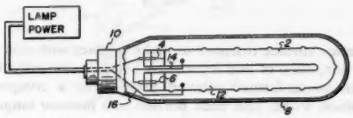
container support means in the form of a rotatable member having opposed faces positioned on said axle portion in a manner to turn freely thereon and track in a direction common with the directional trend of said positioning member, said rotatable member providing facile non-abrasive movement during tube fabrication of said container through said neck portion and into said funnel portion to effect positive and spatial supportive placement of said container relative to the wall of said funnel portion.

3,961,222

SODIUM VAPOR LAMP CONFIGURATION

Charles F. Gallo, Jr., Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 16, 1974, Ser. No. 533,050
Int. Cl.² H01J *17/34*
U.S. Cl. 315—49 **2 Claims**



1. A sodium vapor lamp comprising a sodium vapor discharge tube disposed within an outer transparent envelope, said discharge tube being substantially surrounded by a transparent coating of electrically conductive material being sufficiently resistive to the flow of electrical current to effect ohmic heating of said discharge tube when current is applied to said coating,

a first and a second lamp electrode electrically connected to said discharge tube,

a third and a fourth electrode electrically connected to said conductive coating,

said first, second, third, and fourth electrodes being electrically in series with said first and fourth electrodes being connected to a source of electrical power,

said conductive coating providing positive resistance in the circuit and heat to said discharge tube when energized.

3,961,223

ASTIGMATIC FOCUS CORRECTION CIRCUIT

Thomas J. Ray, Yonkers, N.Y., and Thomas J. Rebeschi, North Haven, Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Mar. 4, 1975, Ser. No. 555,319
Int. Cl.² H01J *29/56, 29/66*
U.S. Cl. 315—371 **2 Claims**

1. In a display system having a source of horizontal and vertical deflection signals, apparatus for correction of the image distortion produced by the astigmatism error generated within a cathode ray tube (CRT), comprising:

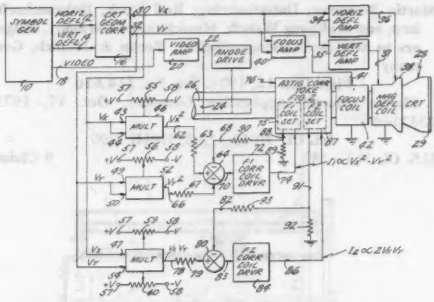
a CRT, having an electron gun for generating an electron beam;

means including a magnetic deflection coil assembly disposed around the outside perimeter of said CRT for deflecting the electron beam in directions radial to the beam axis in response to deflection signals provided thereto by the horizontal and vertical deflection signal source;

an annular magnetic core disposed around the outside perimeter of said CRT between said electron gun and said magnetic deflection coil assembly;

a set of four coils evenly disposed upon said annular core with their geometric centers along the circumference of said core displaced by an arc angle of 90° from the centers of adjacent coils in the same set, and wound upon said core in an electrical series such that adjacent coils in the same set induce mutually opposing magnetic flux lines in said core;

a second set of four coils evenly disposed upon said annular core in the same manner as said first set of coils and interposed with the coils of said first set, with the axes formed by the four coils of said second set being in alignment with the horizontal and vertical axes formed by said



deflection coils, and being displaced by an arc angle of 45° from the axes formed by the four coils of said first set;

means for providing current excitation for said first set of coils in proportion to the difference between the square of the horizontal deflection signal and the square of the vertical deflection signal; and

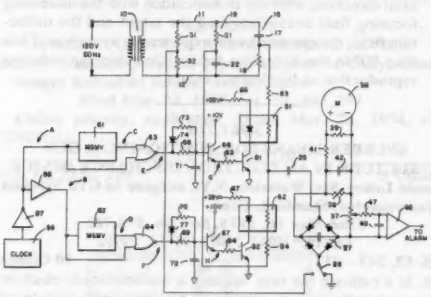
means for providing current excitation to said second set of coils in proportion to the product of said horizontal and vertical deflection signals.

3,961,224

TRANSIENT-FREE ISOLATION MONITOR

Robert W. Vreeland, San Francisco, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

Filed Jan. 30, 1975, Ser. No. 545,492
Int. Cl.² H02H *3/26*
U.S. Cl. 317—18 R **5 Claims**



1. In a line isolation monitor for detecting the existence of ground faults on power conductors normally isolated from ground: first and second phase-shift networks connected between the conductors for providing first and second signals to be monitored, signal monitoring means responsive to a current flowing between the input of the monitoring means and ground, a first photoisolator connected between the first phase-shift network and the input of the monitoring means, a second photoisolator connected between the second phase-shift network and the input of the monitoring means, means for providing first and second generally rectangular timing signals of predetermined frequency and opposite phase,

means including a delay network responsive to the timing signals for delivering generally rectangular control signals which rise gradually from a first level to a second level a predetermined time after a transistion of predetermined polarity in the timing signals, and means for applying the generally rectangular control signals to the photoisolators to alternately condition the photoisolators to pass the first and second signals to the monitoring means, the photoisolators being conditioned to pass the first and second signals to the indicator means when the respective control signals are at the second level.

3,961,225

SURGE ABSORBER

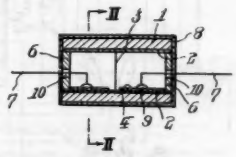
Kan-ichi Tachibana; Michihiro Nishioka; Akio Uchida, and Mikiya Ono, all of Saitama, Japan, assignors to Mitsubishi Mining & Cement Company, Ltd., Tokyo, Japan

Filed Feb. 10, 1975, Ser. No. 548,663

Claims priority, application Japan, Feb. 26, 1974, 49-22679; Apr. 24, 1974, 49-46234

Int. Cl.² H02H 3/22

U.S. Cl. 317—61 **1 Claim**



1. A surge absorber comprising a plurality of carbon thin films isolated from each other respectively at a distance of 10μ – 100μ attached to the surface of an insulating body and a material selected from the group consisting of a metal, an alloy and a conductive adhesive as an electrode directly fixed to each of said plurality of carbon thin films respectively, said metal and alloy being both highly anticorrosive and having a high electric conductivity.

3,961,226

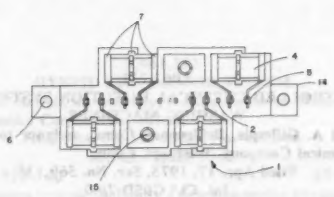
MULTI-TERMINAL ARRESTOR HOLDER AND CONNECTOR MODULE

Bruce E. Hoffman, and S. Thomas Berkley, both of Raleigh, N.C., assignors to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Sept. 5, 1974, Ser. No. 503,403

Int. Cl.² H02H 3/22

U.S. Cl. 317—61.5 **11 Claims**



1. A multi-terminal holder for high voltage surge arrestors and printed circuit boards comprising:

a base member;

a plurality of electrical contact members extending through said base member for providing electrical contact to a circuit board;

a plurality of contact means within said base member for retaining a plurality of voltage surge arrestors and for providing electrical contact between said voltage surge arrestors and said electrical contact members in connection therewith; and

a plurality of ground-arrestor contact means within said base member for removably retaining and electrically connecting said arrestors to a ground terminal in connection therewith;

whereby each of said arrestors makes simultaneous electrical connection between a pair of said contact means and an associated ground-arrestor means when each of said arrestors is individually inserted between said pair of contact means.

3,961,227

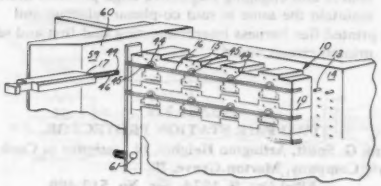
TELEPHONE CONNECTOR BLOCK

Paul V. DeLuca, Port Washington, and William V. Carney, Valley Stream, both of N.Y., assignors to Porta Systems Corporation, Syosset, N.Y.

Filed Feb. 13, 1975, Ser. No. 549,671

Int. Cl.² H02B 1/16

U.S. Cl. 317—101 R **3 Claims**



1. An improved grounding means for use in conjunction with a telephone connector block and a grounding type protector module comprising: a molded body element having means thereon for electrical and mechanical interconnection with a surface of said telephone connector block, said body element defining a plurality of terminals corresponding in configuration to those of said protector module, and defining an elongated groove in an exposed surface thereof; a grounding strip element disposed within said groove and extending to one end of said molded body element, an electrically conductive grounding bar means communicating with said ground strip element and a source of ground potential; said protective module having a grounding prong, said body element having an opening selectively accommodating said prong, said grounding strip element bordering a portion of said opening and establishing communication therewith upon insertion of said prong therein; said grounding strip element including a first strip member having a plurality of planar segments interconnected by a corresponding plurality of arched segments defining an opening, and a second generally planar strip member abutting said first strip member at spaced intervals; said second strip member having detent means thereon in the area of said arched portions of said first strip member.

3,961,228

PRINTED CIRCUIT BOARD ARRANGEMENT

Glenn E. Briggs; Edmund E. Beach, both of Fort Lauderdale, and Walter P. Chase, Sunrise, all of Fla., assignors to Motorola, Inc., Chicago, Ill.

Filed Mar. 28, 1975, Ser. No. 563,417

Int. Cl.³ H05F 1/04

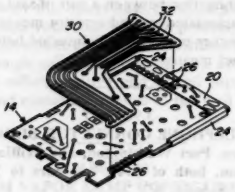
U.S. Cl. 317—101 R **6 Claims**

1. An improved printed circuit board arrangement for electrical apparatus, comprising in combination:

a first printed circuit board for accommodating a plurality of associated components and designed to provide predetermined operational capabilities;

a second printed circuit board for accommodating other circuit components and designed to provide additional operational capabilities,

said first and second printed circuit boards being placed in an edge-to-edge, co-planar relation with one another;



a pair of guide rails for bridging said first and second circuit boards and engaging respective edge portions thereof to maintain the same in said co-planar relation; and

a printed flex harness interconnecting said first and second printed circuit board.

3,961,229

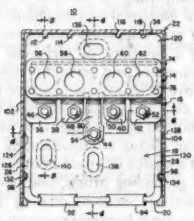
TWO PAIR STATION PROTECTOR

Frank G. Splitt, Arlington Heights, Ill., assignor to Cook Electric Company, Morton Grove, Ill.

Filed Oct. 9, 1974, Ser. No. 513,400

Int. Cl.² H02B 1/08

U.S. Cl. 317—120 **10 Claims**



1. A station protector for mounting overvoltage arresters of the type which protect telephone lines from high voltages or surge currents occurring on said lines, said station protector comprising:

a base assembly having a base portion with a pair of side edges extending between first and second opposed end portions of said base assembly, and an upstanding wall portion at said first end portion,

a mounting section disposed on said base portion adjacent said second end portion and between said side edges, said mounting section having mounting means for mounting said overvoltage arresters,

a terminal section disposed on said base portion adjacent said mounting section and between said mounting section and said upstanding wall, said terminal section generally centrally located between said upstanding wall and said second end portion and having at least four line terminals to be coupled to said lines and a ground terminal, and

a storage area being defined by said upstanding wall, said terminal section and said side edges, the distance between said upstanding wall and said terminal section being at least approximately 40 percent of the distance between said upstanding wall and said second end portion.

3,961,230

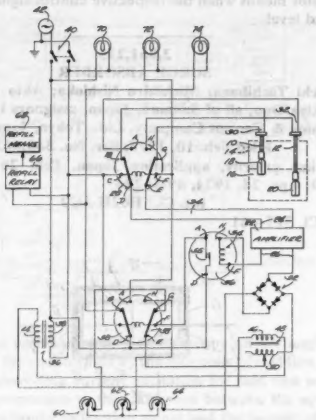
CURRENT RELAY ACTUATED BY MULTISTAGE AMPLIFIER'S TOTAL CURRENT DRAINS

Nelson Hartley, Towson, Md., assignor to Hartley Controls Corporation, Neenah, Wis.

Division of Ser. No. 472,790, May 23, 1974, Pat. No. 3,908,133. This application May 12, 1975, Ser. No. 576,764

Int. Cl.² H01H 47/00

U.S. Cl. 317—123 **2 Claims**



1. In a control circuit including a multi-stage amplifier having signal input terminals and power input terminals, a current source coupled to said power input terminals, a variable signal input device coupled to said signal input terminals, and a current responsive device coupled to said amplifier for initiating a predetermined action in response to a predetermined signal level of said input device, the improvement wherein said current responsive device is coupled in series between said current source and said power input terminals so as to respond to the total current drain of said multi-stage amplifier rather than to the current drain of one stage thereof, thereby achieving maximum sensitivity in response to a given variation of said signal input device.

3,961,231

CONTROLLED CHEMICAL INJECTION SYSTEM FOR WASHING MACHINES

Robert A. Gillespie, Bridgeport, Conn., assignor to Stauffer Chemical Company, Westport, Conn.

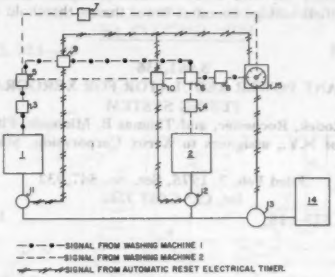
Filed Apr. 17, 1975, Ser. No. 569,135

Int. Cl.² G05D 7/00

U.S. Cl. 317—139 **8 Claims**

1. A system for automatically introducing a chemical, from a metering device, through a chemical introducing means into two or more simultaneously operating programed washing machines, for a predetermined time interval which comprises: an electrical circuit which includes an automatically resettable timing means, settable for the predetermined time interval, means for activating the chemical introducing means in response to the timed interval and means for receiving and relaying a signal from the programmers of the washing machines to the automatically resettable timing means, said receiving and relaying means associated with each washing

machine comprising in combination; means for receiving and holding a signal from a washing machine programmer; a first signal blocking means, activated by a signal from a first washing machine programmer which has activated the timing means, to prevent reactivation of the timing means, by a signal from a second washing machine programmer, before termination of the predetermined time interval; signal time delay means which delays the signal from the signal holding means to permit the timing means to reset after the predetermined time interval; a second signal blocking means, associated with the circuits of all other simultaneously operating washing machines in the system, which passes the signal from the programmer of a first washing machine programmer, when the timing means is not activated by a signal from a second washing machine programmer; and means for directing the chemical introducing activating means, to the chemical introducing means associated with the washing machine whose programmer activated the timing means.



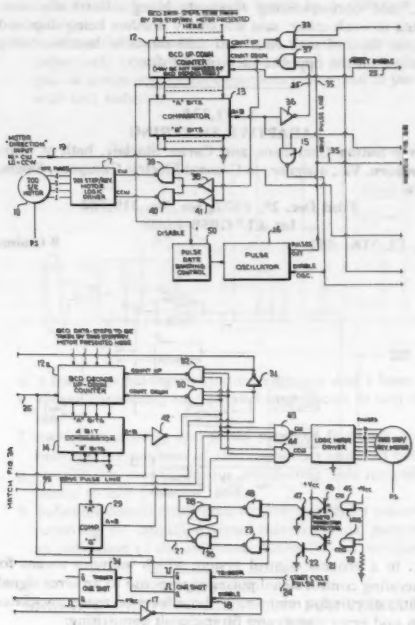
3,961,232

HYBRID STEP MOTOR SYSTEM

Harold R. Newell, S. Newbury, N.H., assignor to Mesur-Matic Electronics Corporation, Salem, Mass.

Filed Apr. 30, 1974, Ser. No. 465,596
Int. Cl.² H02P *5/46*
U.S. Cl. 318—46 **15 Claims**

1. A motor system, including a first step motor having a first housing and a first rotor which rotates relative to said first housing, a source of pulses, means connecting said source of pulses to said first step motor for effecting a step motion of said first rotor in either sense selectively in response to each of said pulses, a second step motor having a second housing and a second rotor which rotates relative to said second housing, logic means connecting said source of pulses to said second step motor for effecting a step motion of said second rotor in either sense selectively in response to each of said pulses, means coupling said first rotor to said second housing for rotation of said second housing in response to rotation of said first rotor, and logic means for controlling the number of pulses applied to each of said step motors from said source of pulses to achieve a total predetermined rotary motion of said second rotor, said second rotor having an output shaft for coupling to a load.

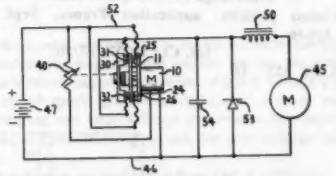


3,961,233

D-C VOLTAGE CONTROL

George A. Fagg, Portland, Oreg., assignor to Controltek, Inc., Portland, Oreg.

Filed Aug. 26, 1974, Ser. No. 500,595
Int. Cl.² H02K *13/00;* **H02P** *5/44, 7/50*
U.S. Cl. 318—361 **8 Claims**



1. A d-c voltage control system comprising a commutator-type switching device arranged to continuously close and open an energizing circuit for a load so as to provide closed circuit and open circuit intervals in each revolution of the commutator, means for varying the duration of said closed circuit intervals in relation to said open circuit intervals, an inductance in series with said load in said energizing circuit, and a rectifier in parallel with said load and inductance; said switching device comprising a commutator, a pair of stationary brushes spaced 180° apart connected to a supply wire, and a pair of movable brushes spaced 180° apart connected to said energizing circuit, said means for varying the duration of said

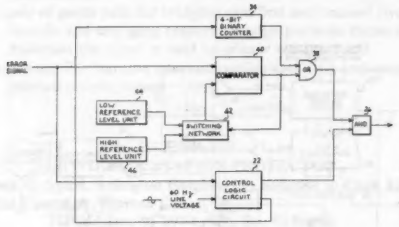
closed circuit intervals shifting said movable brushes; said commutator comprising an insulating disc having conductive segments in corresponding positions on opposite faces of said disc, said corresponding segments being electrically connected to each other, said stationary brushes being disposed on one face of said disc, and said movable brushes being disposed on the opposite face of said disc.

3,961,234

ADAPTIVE FILTERING

George Sutton Chambers, and Carter Sinclair, both of Waynesboro, Va., assignors to General Electric Company, Salem, Va.

Filed Dec. 29, 1972, Ser. No. 319,180
Int. Cl.² G05B *13/00*
U.S. Cl. 318—561 **8 Claims**



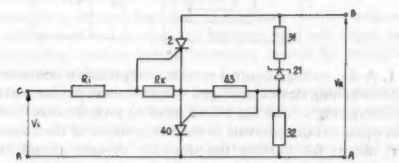
1. In a process control system which includes means for generating control signal pulses in response to an error signal, a filter circuit for minimizing the effects of noise associated with said error signal, and filter circuit comprising:
   a. means to generate a train of control signal pulses;
   b. first means responsive to said error signal for selectively inhibiting a preselected number of control signal pulses whenever said error signal is less than a first predetermined value; and
   c. second means responsive to said error signal for allowing said control signal pulses to pass whenever said error signal is greater than said first predetermined value.

3,961,235

STATIC SWITCH CONTROLLER SYNCHRONIZED WITH A PASSAGE TO ZERO OF THE SUPPLY VOLTAGE

Maurice Sauvanet, Fontenay-le-Fleury, France, assignor to Silec-Semi-Conducteurs, Societe Anonyme, Paris, France

Filed Aug. 15, 1974, Ser. No. 497,798
Claims priority, application France, Sept. 11, 1973, 73.32646
Int. Cl.² H03K *17/56*
U.S. Cl. 323—18 **5 Claims**



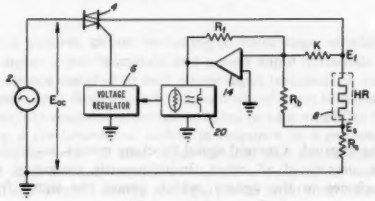
1. An electric circuit for controlling a static switch in synchronism with the passage to zero of the feed voltage comprising:
   a. an auxiliary thyristor provided with an anode, a cathode and a gate;
   b. a control signal source means for applying a control signal to the gate of said auxiliary thyristor;
   c. a feed source means comprising a first terminal and a second terminal;
   d. an anode gate thyristor comprising an anode, a cathode and a gate, the anode of which is connected with the cathode of said auxiliary thyristor and the cathode of which is connected with said second terminal;
   e. an impedance connected between the anode and the anode gate of the anode gate thyristor;
   f. means connected to said first terminal for rectifying the current from said feed source means; and
   g. a biasing impedance connected between the anode gate and the cathode of the anode gate thyristor, said impedance being biased by the rectified current from said rectifying means, whereby a load current may flow in the auxiliary thyristor when the instantaneous value of the rectified voltage becomes lower than a threshold value.

3,961,236

CONSTANT POWER REGULATOR FOR XEROGRAPHIC FUSING SYSTEM

Victor Rodek, Rochester, and Thomas B. Michaels, Pittsford, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Feb. 7, 1975, Ser. No. 547,932
Int. Cl.² G05F *1/44*
U.S. Cl. 323—18 **1 Claim**



1. In a constant power regulator circuit for a variable impedance load which is coupled to a variable voltage alternating current power source, the improvement comprising:
   a summing circuit for maintaining substantially constant the power applied to said variable impedance load as a direct function of the voltage across said variable impedance load plus the current through said variable impedance load, wherein said summing circuit comprises;
   a first voltage tap from said variable impedance load providing a first voltage signal proportional to the voltage applied across said variable impedance load,
   a fixed current measurement impedance in series with said alternating current power source and said variable impedance load,
   said fixed current measurement impedance having a second voltage tap providing a second voltage signal corresponding to the current through said variable impedance load,
   an amplifier having a voltage responsive input,
   first resistance means connecting said input of said amplifier with said first voltage tap to connect said first voltage signal to said amplifier input,
   second resistance means connecting said second voltage tap to the same said input of said amplifier to connect said second voltage signal thereto and to sum said first and second voltage signals at said same input of said amplifier,
   said first and second resistance means and said fixed current measurement impedance having values selected to nominally provide substantially equal first and second said voltage signals to said input of said amplifier.

said amplifier providing an output control signal controlled by said input; and

wherein zero crossing control means are connected between said alternating current power source and said variable impedance load to control the power applied to said variable impedance load, said control means being operative at zero crossing conditions of said alternating current power source,

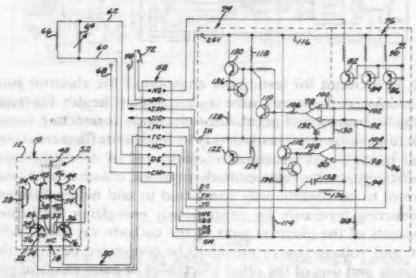
said zero crossing control means being controlled by said output control signal from said amplifier of said summing circuit.

3,961,237

MODULATING ELECTRONIC ROOM THERMOSTAT

Hugh Jean Tyler, Santa Ana, Calif., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Nov. 11, 1974, Ser. No. 522,326
Int. Cl.² G05D *23/24*
U.S. Cl. 323—19 **20 Claims**



18. A thermostatic device for the generation of a plurality of command signals responsive to sensed temperature deviations of a control zone from upper and lower distinct set temperature points which comprise:

temperature responsive means in a temperature sensing location in said control zone;

first command signal generating means including said temperature responsive means and first circuit means to generate a first analog command signal in response to sensed temperature by said temperature responsive means about said upper set temperature point;

second command signal generating means including said temperature responsive means and second circuit means to generate a second analog command signal of discontinuous proportionation to said first command signal and offset therefrom by a band of from 3° to about 15° F. in response to sensed temperature by said temperature responsive means about said lower set temperature point;

adjustment means in said first and second circuit means for the fixed adjustability of said upper and lower set temperature points;

stop means associated with said adjustment means to prevent movement of said adjustment means decreasing the magnitude of said band.

3,961,238

SELECTIVE METAL DETECTOR CIRCUIT HAVING DUAL TUNED RESONANT CIRCUITS

Byron B. Randolph, Jr., Phoenix, Ariz., assignor to Robert F. Gardiner, Phoenix, Ariz.

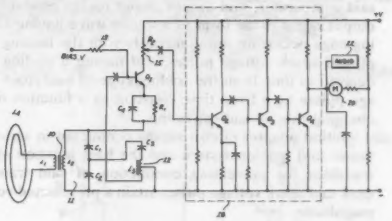
Filed Jan. 22, 1975, Ser. No. 542,961
Int. Cl.² G01V *3/08*
U.S. Cl. 324—3 **3 Claims**

1. In a metal detector of the type to be passed over the ground to detect metallic objects near the surface of the ground, the combination comprising:

a. a search coil;

b. a transistor oscillator for driving said search coil and having a parallel resonant tank circuit and a series resonant feedback circuit, each tuned to a different frequency;

c. said parallel resonant tank circuit including an inductor inductively coupled to said search coil and including a pair of series connected capacitors connected in parallel with said inductor;



d. a transistor having an emitter, collector and a base;

e. means connecting said parallel tank circuit to said emitter;

f. means connecting said series resonant feedback circuit between the junction of said capacitors and said base;

g. amplifying means, means connecting said amplifying means to said collector; and

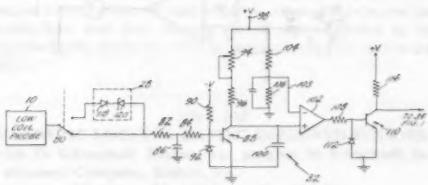
h. indicator means connected to said amplifying means for receiving the amplified signal therefrom and presenting an indication of the amplitude thereof to an operator.

3,961,239

SIGNAL CONDITIONING CIRCUIT FOR VEHICLE DIAGNOSTIC SYSTEM

Richard F. Lach, Hartford, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Mar. 26, 1975, Ser. No. 562,388
Int. Cl.² G01R *13/42, 23/00*
U.S. Cl. 324—15 **3 Claims**



1. In a diagnostic system for a motor vehicle having an internal combustion engine, said engine having an ignition system for selectively supplying a series of spark voltage pulses to a plurality of spark ignition devices, said voltage pulses exhibiting ringing and large voltage excursions, the improvement of a signal conditioning circuit for said voltage pulses comprising

a transistor having an emitter, a base and a collector,

means for biasing the base of said transistor so that said transistor is normally nonconductive,

a capacitor connected to the collector of said transistor,

a source of voltage connected to the collector of said transistor and to said capacitor, said capacitor being charged by said voltage source when said transistor is nonconductive,

a comparator having first and second input terminals and an ouput terminal,

means connecting said voltage source to the first input terminal of said comparator, and connecting said capacitor to the second input terminal of said comparator, said

comparator producing a first voltage output at the output terminal thereof when said capacitor is discharged, and producing a second voltage output at the output terminal thereof when said capacitor is charged to a predetermined voltage level,

means connecting said series of spark voltage pulses to the base junction of said transistor to cause conduction thereof, said capacitor discharging through said conducting transistor,

output circuit means connected to the output terminal of said comparator, said output circuit means producing an output signal in the form of a square wave having a leading edge occurring simultaneously with the leading edge of said spark voltage pulses, and having a trailing edge delayed in time from the trailing edge of said spark voltage pulses by a fixed time constant as a function of the charging rate of said capacitor,

and ignition adapter circuit means connected in series between said ignition system and the base junction of said transistor for preventing conduction of said transistor until said spark voltage pulses attain a preselected voltage magnitude.

3,961,240

TESTING ELECTRICAL IGNITION SYSTEMS OF INTERNAL COMBUSTION ENGINES

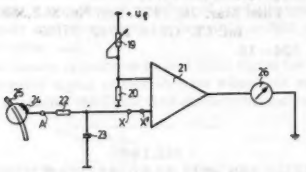
Dieter Pohl, Boll, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Aug. 6, 1974, Ser. No. 495,194

Claims priority, application Germany, Aug. 31, 1973, 2343895

Int. Cl.² G01R *13/42, 23/00, 27/00*

U.S. Cl. 324—16 R **7 Claims**



4. Test apparatus to test electrical ignition of internal combustion engines comprising

means (24) deriving a signal having a wave shape directly corresponding to an ignition pulse applied to the spark plug (18) of the internal combustion engine;

a low pass filter (22, 23) having said derived signal applied thereto and forming an average signal;

comparator means (21) having said average signal applied to one input and a reference signal applied to another input;

output means (26) sensing whether the average signal is above, or below said reference signal;

a timing circuit (27) starting a timing interval upon generation of said ignition pulse;

and switch means (30) connecting the output of said low pass filter with the comparator, controlled by said time circuit, upon lapse of said timing interval.

3,961,241

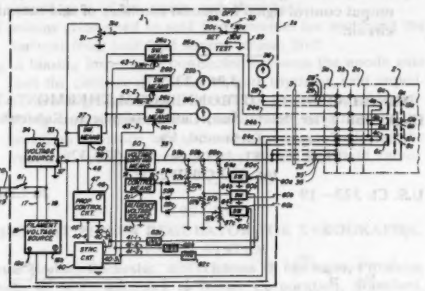
EMISSION TESTING CIRCUIT FOR COLOR CATHODE RAY TUBES

Richard Goldstein, Deerfield, and Harold Feldman, Skokie, both of Ill., assignors to Dynascan Corporation, Chicago, Ill.

Filed Apr. 30, 1975, Ser. No. 573,370

Int. Cl.² G01R *31/024*

U.S. Cl. 324—20 CR **12 Claims**



1. In a circuit for testing the emission of the electron guns of a color cathode ray tube and including heater filament, cathode, control and accelerator electrode connecting terminals to be connected respectively to the heater filament, cathode, control and accelerator electrodes of the respective electron guns of a color cathode ray tube, a source of heater current to be continuously connected to said heater filament connecting terminals for continuously energizing the heater filaments of the electron guns of the cathode ray tube under test, and voltage source means to be connected between the cathode and one of the other electrodes of each electron gun for causing electron emission which is an indication of the electron emitting capabilities thereof, the improvement comprising separate emission indicating means for each electron gun of the cathode ray tube to be tested, each emission indicating means providing an indication as to whether or not the current flow between the cathode and said other electrode of the associated electron gun is at an adequate level, and switching means for sequentially connecting said voltage source means and emission indicating means to said electron gun electrode connecting terminals for cyclically establishing in sequence the flow of emission current between the cathode and said other electrodes of said various electron guns, whereby emission current flow occurs in only one electron gun at any given time segment of each switching cycle, while said emission indicating means simultaneously indicate the emission produced by the electron guns.

3,961,242

EMISSION TESTING CIRCUIT FOR COLOR CATHODE RAY TUBES

Gus C. Rose, Wood Dale, Ill., assignor to Dynascan Corporation, Chicago, Ill.

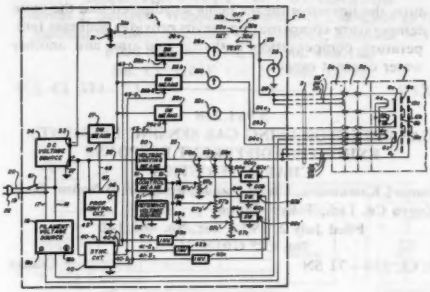
Filed Apr. 30, 1975, Ser. No. 573,374

Int. Cl.² G01R *31/024*

U.S. Cl. 324—20 CR **9 Claims**

1. In a circuit for indicating the individual and relative emission capabilities of the electron guns of a color cathode ray tube of a television receiver and including heater filament, cathode, control and accelerator electrode connecting terminals to be connected respectively to the heater filament, cathode, control and accelerator electrodes of the respective electron guns of a color cathode ray tube, said circuit including a source of heater current to be continuously connected to said heater filament connecting terminals for continuously energizing the heater filaments of the electron guns of the cathode ray tube under test, and voltage source means to be connected between the cathode and one of said other elec-

trodes of each electron gun for causing electron emission which is an indication of the electron emitting capability thereof, the improvement comprising separate emission current indicating means responsive to flow of current flow between the cathode connecting terminal and one of the other electrode connecting terminals for all of the electron guns for respectively simultaneously displaying the values of said current flow, and adjustable means for simultaneously progressively varying to the same degree the emission current indications of said separate current indicating means so the highest or lowest indication can be brought to a given reference value from which it can be readily determined if the other of same is beyond or below a value indicating an unacceptable ratio of the same.



3,961,243

INDUCTIVE DISPLACEMENT TRANSDUCER USING A BRIDGE CIRCUIT HAVING A STABLE VOLTAGE PHASE IN THE DIAGONAL OF THE BRIDGE

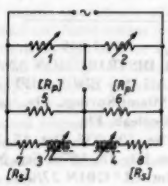
Winfried Schulz, Berlin, Germany[2], assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed May 17, 1974, Ser. No. 470,904

Claims priority, application Germany, May 21, 1973, 2326257

Int. Cl.[2] G01R *33/00*

U.S. Cl. 324—34 D **3 Claims**



1. In an inductive displacement transducer comprising a current measuring bridge circuit for measuring an a-c current of a frequency W and including in one half of the bridge circuit a pair of adjustable electrical resistors coupled in series relationship, and in the other half of the bridge circuit a pair of series coupled electrical induction coils having the same dimensions and electrical characteristics and a movable magnetic armature inductively coupled to the induction coils, with each of said coils having the same electrical inductance L when the armature is positioned symmetrically with respect to the induction coils, and each bridge circuit branch which includes an induction coil having the same ohmic resistance R_p, said induction coils and said electrical resistors being coupled in parallel relationship, the improvement comprising a pair of series coupled electrical shunt resistors each coupled in parallel relationship to one of said induction coils, with the electrical resistance R_p of each of said shunt resistors being determined by the equation $R_p = W^2L^2/R_s$, and WL is chosen so as to be substantially greater in value than R_s.

3,961,244

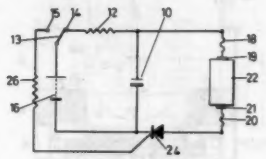
MAGNETIZING MEANS FOR A MAGNETIC FLAW DETECTOR INCLUDING A CHARGING AND DISCHARGING CIRCUIT

Raphael Isaac Minchom, London, England, assignor to Minchom Magnetic Systems Limited, London, England

Filed Sept. 11, 1974, Ser. No. 505,047

Int. Cl.[2] G01R *33/12*

U.S. Cl. 324—38 **11 Claims**



1. Apparatus for magnetically detecting flaws in a magnetisable object, the said apparatus comprising a first circuit having a storage capacitor therein and adapted to be connected across a D.C. battery; a second circuit comprising a series circuit including the said storage capacitor, a thyristor, and two conductors each extending to a permanent magnet and wound about said magnet, said magnet magnetically connecting said conductors and the storage capacitor to the object; a third circuit comprising the said thyristor and adapted to be connected across the said D.C. battery; and a multi-position switch connected in both the first and third circuits, the switch having a first position in which the second and third circuits are open-circuited and in which the first circuit is completed to effect charging of the storage capacitor by the D.C. battery, and the switch having a second position in which the first circuit is open-circuited and the third circuit is closed, such closure of the third circuit causing the thyristor to close the second circuit whenever said object is connected between the conductors, and thus causing the storage capacitor to be hyperbolically discharged and to generate magnetic flux in the object.

3,961,245

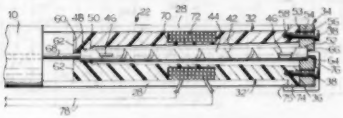
MAGNETIC LOCATOR HAVING IMPROVED SENSORS

Erick O. Schonstedt, Reston, Va., assignor to Schonstedt Instrument Company, Reston, Va.

Filed Nov. 20, 1974, Ser. No. 525,574

Int. Cl.[2] G01R *33/02*

U.S. Cl. 324—43 R **20 Claims**

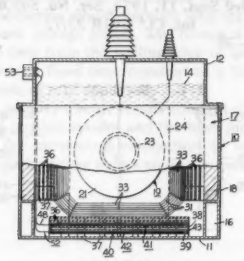


1. Magnetic sensor apparatus comprising a housing for an elongated magnetic core, the housing including an elongated bobbin having a longitudinal cavity therein for receiving the core and having means for pivotally engaging one end of the core, and an end piece for connection to the bobbin, the end piece having means for engaging the other end of the core and the position of the end piece being adjustable transversely relative to the bobbin.

3,961,246
CAPACITANCE METHOD OF MONITORING INSULATION DRYNESS OF AN ELECTRICAL INDUCTION APPARATUS

Michael W. Waterman, Milwaukee, and Samuel L. Foster, Eagle, both of Wis., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Nov. 7, 1974, Ser. No. 521,743
Int. Cl.² G01R 27/26, 31/12
U.S. Cl. 324—54 8 Claims



1. In a method of determining the insulation dryness of an electrical reactor device immersed in oil contained in a tank which is at ground potential without de-energizing the reactor device comprising:

providing a pair of spaced apart electrodes separated by at least one layer of representative insulation of the reactor device which is disposed adjacent to the bottom of the tank to form a capacitor;

grounding the one electrode nearest to the windings of the reactor device;

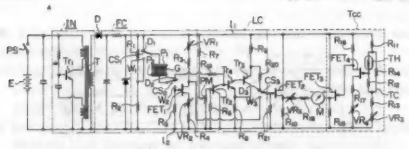
measuring the dissipation or power factor between the grounded and ungrounded electrodes to obtain a value; and,

comparing the dissipation or power factor measured value obtained to similar dissipation or power factor data previously obtained on the representative or similar insulation of the reactor device of known dryness.

3,961,247
LINEAR OUTPUT MOISTURE METER WITH TEMPERATURE COMPENSATOR

Kuni Toki, Tokyo, Japan, assignor to Kett Electric Laboratory, Tokyo, Japan

Filed June 16, 1975, Ser. No. 587,495
Claims priority, application Japan, July 19, 1974, 49-83013
Int. Cl.² G01R 27/02
U.S. Cl. 324—65 R 6 Claims



1. A moisture measuring apparatus for measuring the water content of a specimen by measuring the electric resistivity of the specimen which has a correlation with the water content, the electric resistivity of the specimen varies non-linearly with the water content in one water content range and linearly with the water content in another water content range, comprising:

means for measuring the electric resistivity of said specimen;

linearizer means for generating an electric signal varying linearly with the water content of the specimen in said one water content range from an electric signal changing non-linearly with the water content;

indicator means for indicating the measured quantity in terms of the water content;

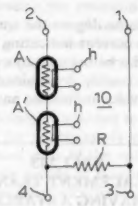
change-over means for connecting and disconnecting said linearizer means between said resistivity measuring means and said indicator means; and

temperature compensating means for measuring the temperature of the specimen and shifting the zero point of the indicator means corresponding to the measured temperature, the linearizer means being so adjusted that the same temperature compensating means provides accurate temperature compensation both for said one and another water content ranges.

3,961,248
GAS DETECTOR USING GAS SENSING ELEMENTS EXHIBITING DIFFERENT RESPONSE CHARACTERISTICS

Masanori Kawamura, Chiba, Japan, assignor to Nohmi Bosai Kogyo Co. Ltd., Tokyo, Japan

Filed July 2, 1974, Ser. No. 485,140
Int. Cl.² G01N 31/06
U.S. Cl. 324—71 SN 5 Claims



1. A gas detector comprising:

a pair of input terminals;

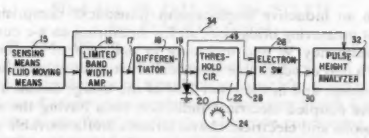
a pair of output terminals; and

an electrical circuit comprised of a plurality of gas sensing elements serially connected across said input terminals through a resistor connected across said output terminals, said gas sensing elements each having a different sensitivity for at least one of the gaseous components to be detected.

3,961,249
PARTICLE SIZE DISTRIBUTION ANALYZATION EMPLOYING TRAILING EDGE DIFFERENTIATION

Wallace H. Coulter, Miami Springs, Fla., assignor to Coulter Electronics, Inc., Hialeah, Fla.

Continuation of Ser. No. 404,035, Oct. 15, 1973, abandoned.
This application July 18, 1975, Ser. No. 597,081
Int. Cl.² G01N 27/00
U.S. Cl. 324—71 CP 15 Claims



1. In a method for particle distribution analyzation, each particle when passing through a sensing zone producing a pulse having an amplitude proportional to the size of the particle, said method comprising the steps of: differentiating at least one edge of each particle-produced pulse, short-circuiting to ground the other edge of each particle-produced pulse, passing the differentiated pulse to a limiting stage to

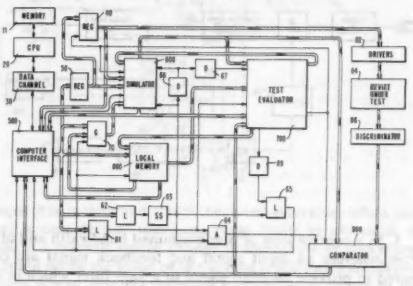
produce signals for controlling the passage of a part of the differentiated pulse to pulse amplitude analyzing means, and employing the height of the resulting differentiated pulse part as a measure of the size of the original particle-produced pulse.

3,961,250

LOGIC NETWORK TEST SYSTEM WITH SIMULATOR ORIENTED FAULT TEST GENERATOR

Thomas J. Snethen, Wappinger Falls, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 8, 1974, Ser. No. 468,108
Int. Cl.² G01R *15/12*; G06F *11/00*
U.S. Cl. 324—73 R **8 Claims**



1. A logic network tester for testing a logic network having a plurality of primary inputs and primary outputs and including a plurality of logic blocks having inputs and outputs, at least some of said inputs and outputs being inaccessible within the logic network, comprising:

simulator means for simulating the logic network to be tested and identifying the plurality of logic blocks and the inputs and outputs to each of said blocks;

means for applying a test pattern of binary valued signals to the primary inputs of said simulated network;

test evaluator means operatively associated with and responsive to said simulator means for determining whether said test pattern should also be applied to the network under test, and causing said means for applying a test pattern to apply said test pattern to the network under test, if desired; and

comparator means responsive to both said network under test and said simulated network for comparing corresponding outputs of said network under test and said simulated network.

3,961,251

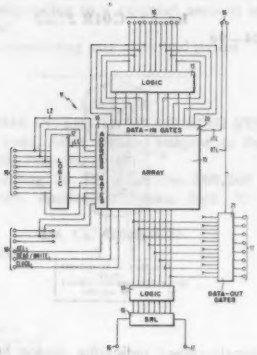
TESTING EMBEDDED ARRAYS

William J. Hurley, Poughkeepsie, and Hans P. Muhlfeld, Highland, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 20, 1974, Ser. No. 534,605
Int. Cl.² G01R *15/12*
U.S. Cl. 324—73 AT **9 Claims**

1. In an LSI semiconductor device comprising a memory array, associated logic circuitry and primary access points to and from external circuitry, operatively associated and so arranged as to provide no direct access from said primary access points to all portions of said memory array, the improvement comprising;

means bypassing said associated logic circuitry for loading a test pattern into said array directly from primary access points; and,



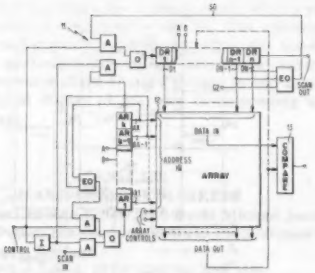
means bypassing said associated logic circuitry for testing the output of said memory array.

3,961,252

TESTING EMBEDDED ARRAYS

Edward B. Eichelberger, Purdy Station, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 20, 1974, Ser. No. 534,606
Int. Cl.² G01R *15/12*
U.S. Cl. 324—73 AT **11 Claims**



1. In the testing of a memory array including address and data registers, the improvement comprising:

means for scanning a test pattern into the address and data registers;

means for shifting the test pattern through said address and data registers;

means converting said registers to counters;

feedback means for recirculating said register counter outputs to said address and data register inputs; and,

means for testing the output of said memory array.

3,961,253

ELECTRICAL VOLTAGE INDICATING DEVICE

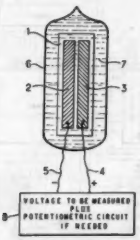
Alfred Brych, Chasseneuil-du-Poitou, France, assignor to Saft-Societe des Accumulateurs Fixes et de Traction, Romainville, France

Filed Oct. 3, 1974, Ser. No. 511,672

Claims priority, application France, Oct. 16, 1973, 73.36810

Int. Cl.² G01R 27/22

U.S. Cl. 324—94 7 Claims



1. Electrical voltage indicating device for d.c. voltages comprising at least one electrochemiluminescent cell, said cell containing a non-aqueous electrolyte and solvent, at least one electrochemiluminescent substance whose excitation threshold has a value that corresponds to the value of a voltage to be detected and indicated, a pair of electrodes in said cell immersed in said electrolyte and spaced apart not greater than 0.5 mm, and means for connecting said electrodes to the d.c. voltage to be detected and indicated.

3,961,254

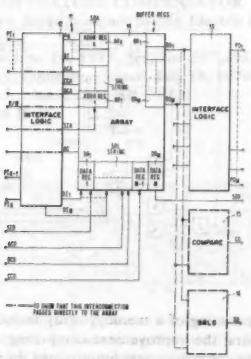
TESTING EMBEDDED ARRAYS

Joseph R. Cavallere, and Rocco Robortaccio, both of Hopewell Junction, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 20, 1974, Ser. No. 534,608

Int. Cl.² G01R 15/12

U.S. Cl. 324—73 AT 7 Claims



1. In an LSI semiconductor device comprising a memory array, including address, data and buffer registers, associated logic circuitry and primary access points to and from external circuitry, operatively associated and so arranged as to provide no direct access from said primary access points to all portions of said memory array, the improvement comprising:

means bypassing said associated logic circuitry for loading a test pattern into one of said address and data registers directly from primary access points; and,

means bypassing said associated logic circuitry for testing the output of said memory array.

3,961,255

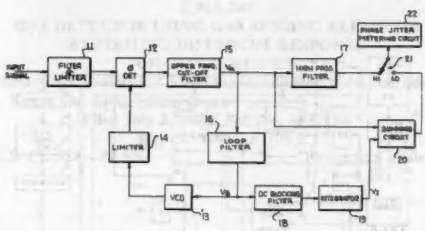
MEASUREMENT BANDWIDTH ENHANCEMENT IN PHASE LOCK LOOPS

Norris C. Hekimian, Rockville, Md., assignor to Hekimian Laboratories, Inc., Rockville, Md.

Filed Aug. 15, 1974, Ser. No. 497,817

Int. Cl.² G01R 25/00

U.S. Cl. 324—83 R 9 Claims



1. In a control loop of predetermined bandwidth and of the type wherein an input signal and feedback signal are compared to provide an error signal to a loop filter which in turn controls a feedback circuit which provided the feedback signal, a method of measuring said error signal over a bandwidth which extends to frequencies below the loop bandwidth, said method comprising the steps of:

processing the output signal from said low pass loop filter through a circuit having a transfer characteristic which matches the transfer characteristic of said feedback circuit;

summing the processed output signal with said error signal; and

measuring the amplitude of the summed signals.

3,961,256

LIGHT-EMITTING SEMICONDUCTOR DISPLAY APPARATUS FOR DISPLAYING A BAND REPRESENTATION OF A VOLTAGE ANALOG OF A MEASURED PARAMETER

Colin Simister Gaskell, Waresley, and Rory Morgan O'Brien, Weston, both of England, assignors to Alfred Herbert Limited, Coventry, England

Filed Oct. 10, 1974, Ser. No. 513,944

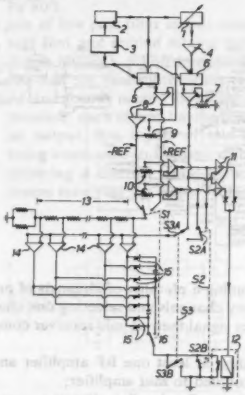
Claims priority, application United Kingdom, Oct. 17, 1973, 48453/73

Int. Cl.² G01R 31/00, 13/02, 19/16

U.S. Cl. 324—96 16 Claims

1. Apparatus for use in conjunction with means for forming a voltage analog of a parameter to be measured, for providing a visual display of the value of the analog and hence of the parameter, said apparatus comprising a series of semiconductor light emission means, a conductor portion for receiving said voltage analog, and electrical circuitry including a plurality of resistors for forming a series of different reference voltages and comparator means operable to compare said voltage analog with said reference voltages and to cause the light emission means to emit light whereby they provide a band representation of the value of said analog with a zero value of the analog being represented by a band terminating intermediate the ends of the said series, said circuitry further including means for forming two signals respectively defining the upper and lower limits of a predetermined tolerance range for said

analog, both said upper and lower tolerance range limits being intermediate the limits of the range of measurement of the apparatus, further comparator means operable for determining when said analog is outside said tolerance range limits, and means which is connected to be controlled by said further



comparator means and which becomes operable, when said anlog is outside said tolerance range limits as aforesaid, to produce a marked visible change in the nature of said representation while the value of the analog is still being displayed, in such a way that the operator's attention is drawn to the displayed value.

3,961,257

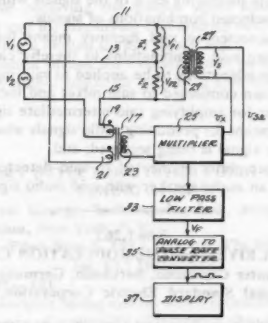
SINGLE PHASE 3-WIRE ELECTRONIC ELECTRICAL ENERGY METER

Miran Milkovic, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Sept. 13, 1974, Ser. No. 505,798

Int. Cl.² G01R *7/00, 11/32*

U.S. Cl. 324—142 **3 Claims**



1. An apparatus for measuring the electrical energy in a single phase, three-wire, a.c. system comprising:

a current transformer having two primary windings and a single secondary winding, one of said primary windings being connected in series with one of said wires and the other of said primary windings being connected in series with a second one of said wires,

a potential transformer having a primary and a secondary winding, the primary winding of said potential transformer being connected across the load impedances of said three-wire electrical system,

pulse width amplitude multiplying means connected to the secondary of said current transformer and the secondary of said potential transformer for generating a signal which is proportional to the total power in said electrical system,

means for converting said power proportional signal to a pulse train having a pulse repetition rate which is proportional to the total average power in said system, each pulse corresponding to a constant amount of electrical energy, and

means for accumulating said electrical pulses.

3,961,258

PULSE TIME INTERVAL MEASURING SYSTEM

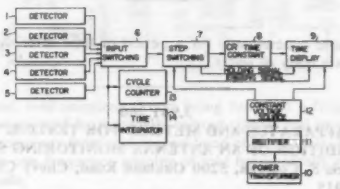
Nobukazu Morisaki, Aichi, Japan, assignor to Daido Metal Company, Ltd., Nagoya, Japan

Filed Aug. 26, 1974, Ser. No. 500,740

Claims priority, application Japan, Sept. 7, 1973, 48-100875

Int. Cl.² G04F *8/00*

U.S. Cl. 324—189 **3 Claims**



1. A pulse time interval measuring system comprising a plurality of signal generating means each generating a pulse train signal, selecting means connectable to any desired one of said signal generating means, step switching means connected to said selecting means and having a first and a second contact mechanism arranged to be changed over stepwise in interlocking relation in response to the output of said selecting means, a CR time constant circuit having a capacitor and a resistor, said CR time constant circuit so connected to said first contact mechanism that said capacitor is charged only when a predetermined contact is connected to said RC time constant circuit, while said capacitor discharges when the remaining contacts are connected thereto, and time display means for measuring the value of the charged voltage in said capacitor to give a digital display of the time corresponding to the charged voltage.

3,961,259

MARINE SMOKE MARKERS

William Rupert Brooke Elstow, and David Michael Jennings, both of Salisbury, England, assignors to Pains-Wessex Limited, Salisbury, England

Filed July 5, 1974, Ser. No. 486,209

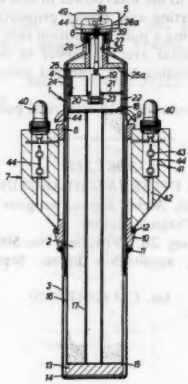
Claims priority, application United Kingdom, July 5, 1973, 31994/73

Int. Cl.² B63B *21/52;* **H04B** *1/034*

U.S. Cl. 325—66 **20 Claims**

1. Personnel marine smoke marker for marine use comprising an elongate casing, a mass of smoke-generating composition contained in said casing, igniting means for igniting said smoke-generating composition, a buoyance flotation ring, said flotation ring surrounding said casing over a part only of the length of said casing, a radio transmitter, said transmitter being recessed into said flotation ring, whereby the range of detection is increased while the marker is kept compact, an aerial, a power source for said transmitter, and circuitry con-

necting said power source and said aerial to said transmitter, the transmitter and the smoke-generating composition being



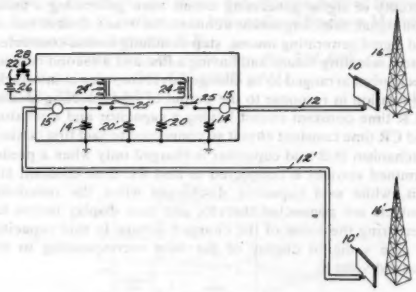
operable concurrently for a period of time after the marker enters a body of water.

3,961,260

APPARATUS AND METHOD FOR TESTING THE CONDITION OF AN ANTENNA MONITORING SYSTEM

Francis S. Colligan, 5200 Oakland Road, Chevy Chase, Md. 20015

Filed June 5, 1973, Ser. No. 367,340
Int. Cl.[2] H04B 17/00
U.S. Cl. 325—133 **16 Claims**



1. In an antenna monitoring system having at least one sampling element coupled to an antenna element, an antenna monitor having at least a first impedance and at least one electrical energy conductor connected between the sampling element and the impedance, the improvement comprising:

at least one additional passive impedance located for selective placement in circuit relationship with said first impedance; and

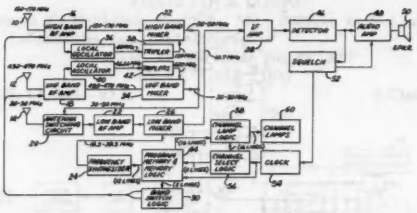
circuit means in operative relationship with said additional impedance for selectively placing said additional impedance in circuit with said first impedance and for enabling changes in said monitoring system to be determined by comparing the currents passing through said first and said additional impedances when the antenna element and the monitoring system are known to be operating properly with the currents passing through said first and said additional impedances when the antenna element and the monitoring system are now known to be in proper operating condition.

3,961,261

CRYSTALLESS SCANNING RADIO RECEIVER

Peter W. Pflasterer, Oak Ridge, Tenn., assignor to Tennelec, Inc., Oak Ridge, Tenn.

Filed Mar. 14, 1974, Ser. No. 450,983
Int. Cl.[2] H04B 1/06
U.S. Cl. 325—335 **23 Claims**



1. A receiver for scanning a plurality of channels of predetermined radio frequency channels and selecting one channel having a radio frequency signal thereon said receiver comprising:

an RF section including at least one RF amplifier and an associated mixer coupled to said amplifier;

means for generating one of a plurality of beating signals of preselected frequency for application to said mixer to tune a received channel signal and provide an intermediate signal in response to said channel signal;

said beating signal generating means comprising a phase-locked-loop frequency synthesizing means having at least one input thereto, wherein various preselected combinations of signals applied to said input produces said beating signals of preselected frequencies at the output of said generating means;

programmable memory means connected to said input for storing said various preselected combinations of signals at predetermined addresses;

means for programming said memory means to enter said various preselected combinations of signals at predetermined addresses in said memory means, said programming means including switching means for manually and separately producing each of the signals within said various preselected combinations of signals;

means connected to said memory means for selectively addressing said combinations to thereby cause said selected combinations to be applied to said input;

an IF section connected to said mixer and including an IF amplifier for amplifying said intermediate signal;

detector means for producing audio signals when said intermediate signal is being received; and,

an audio amplifier connected to said detector means for driving an audio speaker with said audio signals.

3,961,262

FM RECEIVER AND DEMODULATION CIRCUIT

Gerhard-Gunter Gassmann, Berkheim, Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Nov. 15, 1974, Ser. No. 524,097
Claims priority, application Germany, Nov. 22, 1973, 2358288
Int. Cl.[2] H04B 1/00
U.S. Cl. 325—345 **7 Claims**

1. A receiver for frequency modulated RF signals having a known center frequency and bandwidth, comprising:

a first and second signal mixing means each having first and second inputs and an output;

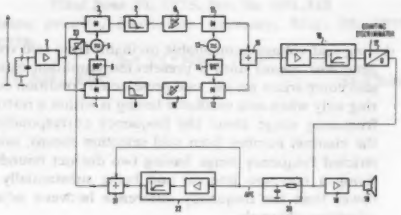
means for receiving said frequency modulated RF signals and providing said signals to the first inputs of said first and second mixing means;

first oscillator means having an output for providing a signal having a frequency approximately 10 kHz from the center frequency of the received signal, the output of said oscillator means being connected to the second inputs of each of said first and second mixing means;

phase shifting means disposed at one of said inputs of the first mixing means for shifting the signal applied thereto by 90°;

a pair of low pass filter means connected to the outputs of said first and second mixing means, said low pass filter means having a cut off frequency equal to approximately one-half the bandwidth of the received signals;

third and fourth means for signal mixing and carrier suppression, each means having first and second inputs and an output, first inputs of said third and fourth means being connected to the pair of low pass filter means for receiving a filtered signal therefrom, said third mixing means receiving the signal from the first mixing means;



second oscillator means having an output providing a signal having a frequency equal to at least twice the cut off frequency of the low pass filter means, the output of said oscillator means being connected to the second inputs of each of said third and fourth mixing means;

phase shifting means disposed at the second input of the third mixing means for shifting the signal received thereby by 90°;

adding means having first and second inputs connected to the outputs of the second pair of mixing means for adding the signals received therefrom and for providing an output signal;

means for receiving the output signal from the adding means and for amplifying and limiting said signal and for providing a limited output signal; and

demodulation means for receiving and demodulating the limited output signal for providing a demodulated audio signal.

3,961,263

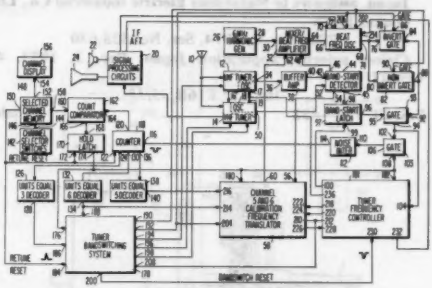
BANDSTART DETECTOR SYSTEM FOR A TELEVISION TUNING SYSTEM

John Barrett George, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed June 3, 1974, Ser. No. 476,086
Int. Cl.² H04B 1/16
U.S. Cl. 325—421 **3 Claims**

1. In a television tuning system which provides for the selection of any one of a plurality of television channels in at least a first band of radio frequencies where access to said one channel is accomplished by a sweeping of an oscillator of a tuner through at least a second band of frequencies and where said one channel is identified by comparing a signal from said oscillator with a plurality of harmonically related signals within said second band of frequencies and accumulating in a counter a count representative of the number of predetermined frequency comparisons between said oscillator signal and said harmonically related signals encountered during a period of sweeping of said oscillator, a system for initiating counting by said counter, comprising:

first means coupled to said oscillator for developing a control signal having a magnitude representative of a frequency difference between said signal from said oscillator and a frequency selected in predetermined relationship to said second band of frequencies, said first means comprising a resonant circuit tuned to said frequency selected in predetermined relationship to said second band of frequencies and adapted to be coupled to said oscillator, a unilateral conducting device having a first terminal coupled to said resonant circuit and a second terminal, and means coupled to said second terminal of said unilateral conducting device for the development of said control



signal, said resonant circuit being tuned to a frequency between said harmonically related signals and separated in frequency from said second band of frequencies by less than one frequency spacing of said harmonically related signals;

second means coupled to said first means and responsive to said control signal for providing a first output when said control signal magnitude is less than a threshold value and for providing a second output when said control signal magnitude is greater than said threshold value; and

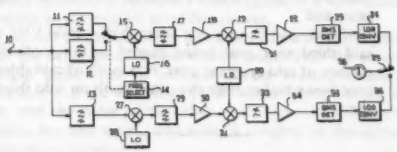
means coupling said second means to said counter for conditioning said counter for operation upon a transition between said first and said second output.

3,961,264

LINEAR FREQUENCY CONVERTER WITH GAIN INDEPENDENT OF CIRCUIT PARAMETERS

Norris C. Hekimian, Rockville, Md., and Walter Mack, Falls Church, Va., assignors to Hekimian Laboratories, Inc., Rockville, Md.

Filed May 2, 1974, Ser. No. 466,459
Int. Cl.² H04B 1/28
U.S. Cl. 325—451 **8 Claims**



1. A frequency converter circuit responsive to a local oscillator signal and an input voltage signal for providing an output signal at a predetermined frequency, said circuit comprising:

active means for converting said input voltage signal to a signal current having an amplitude proportional to the input voltage;

circuit means tuned to said predetermined frequency;

current steering means responsive to said local oscillator signal for alternately conducting said signal current via two paths to said circuits means;

output means operable over a range of relatively low applied signal amplitudes;

means for applying said output signal to said output means at an amplitude which is a function of the current conducted to said circuit means by said steering means; and

current limiting diode means for limiting the maximum possible current through said steering means to a level which corresponds to an output signal amplitude residing within said range of relatively low amplitudes.

3,961,265

VHF-UHF SWITCHING MECHANISM OF A TELEVISION RECEIVER

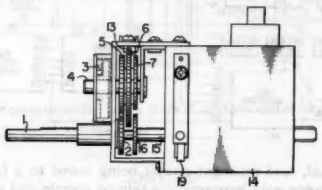
Tugio Ohigashi, Aichi, and Junichi Ariga, Inazawa, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 2, 1974, Ser. No. 528,630

Claims priority, application Japan, Dec. 3, 1973, 48-139627[U]

Int. Cl.² F16H *35/18*

U.S. Cl. 325—452 **2 Claims**



1. A VHF-UHF switching mechanism for a television receiver having a VHF tuner including a tuner shaft therein, comprising

a rotatably supported main operation shaft;

a first spur gear fixed to said main operation shaft;

a switch shaft rotatably supported adjacent said main operation shaft;

a second spur gear fixed to said switch shaft, said second spur gear meshing with said first spur gear;

a switch coupled to said switch shaft, operation of said switch switching between UHF stations in regular sequence in accordance with the rotational position of said switch shaft;

a segment gear fixed to said switch shaft, part of the outer periphery thereof being formed as a circular arc and the remaining part being formed as a toothed gear surface, the heights of the two teeth positioned on both sides of the circular arc surface of said segment gear being lower than the heights of the remaining teeth on said segment gear; and

a third spur gear fixed to the tuner shaft of said VHF tuner, said third spur gear being geared to the toothed gear surface of said segment gear, one tooth of said third spur gear being higher than the other teeth on said third spur gear.

3,961,266

CHANNEL SEEKING TUNING SYSTEM

Akio Tanaka, Evanston, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Jan. 3, 1974, Ser. No. 430,446

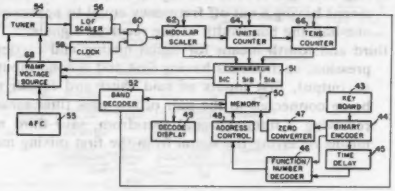
Int. Cl.² H04B *1/06*

U.S. Cl. 325—452 **44 Claims**

1. In a television tuning system including a voltage controllable oscillator for selectively tuning a plurality of fixed frequency bandwidth television channels in a predetermined range of frequencies, channel number selection means, voltage generating means for changing the tuning frequency of said voltage controllable oscillator and comparison means, the method of operating said tuning system comprising the steps of:

encoding on a sample basis the tuning frequency of said oscillator into channel number information related to the channel numbers of corresponding receivable television channels;

comparing channel number information from said channel number selection means with said channel number information from said oscillator;



driving said voltage controllable oscillator from said voltage generator means until a preselected condition exists in said comparison means, said preselected condition occurring only when said oscillator tuning is within a restricted frequency range about the frequency corresponding to the channel number from said selection means, said restricted frequency range having two distinct bounds defining a non-zero interval and being substantially narrower than the frequency difference between adjacent television channels.

3,961,267

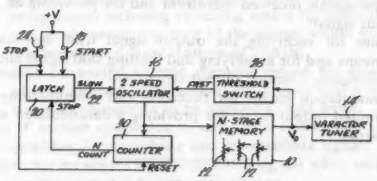
CHANNEL SELECTING CONTROL SYSTEM FOR TELEVISION TUNER INCLUDING UNUSED CHANNEL SKIP SYSTEM

William R. Weissmueller, Jr., Wildwood, Ill., assignor to Warwick Electronics Inc., Chicago, Ill.

Filed Nov. 1, 1974, Ser. No. 520,030

Int. Cl.² H04B *1/32*

U.S. Cl. 325—470 **14 Claims**



1. In a receiver having an electrically controlled tuner, a sequential tuning system comprising:

a plurality of actuable stages corresponding to a plurality of frequencies only some of which are to be selected, each stage having an adjustable resistor which can be varied to change the level of a tuning signal coupled when the stage is actuated to the tuner to control the frequency thereof;

each adjustable resistor being adjustable to generate a predetermined level of tuning signal when the associated stage is to be effectively skipped during a scanning sequence;

sequence means for sequentially actuating at a slow rate each of the plurality of stages to sequentially generate tuning signals from the adjustable resistor in order to step the tuner sequentially through the entire plurality of frequencies;

switch means responsive to generation of tuning signals having the predetermined level for causing the sequence means to step at a fast rate to actuate the next stage to

thereby effectively skip stages which are not to be selected during the scanning sequence;

frequency stopping means actuable for stopping the sequence means when the tuner has been stepped to any desired frequency in order to maintain the receiver tuned to the desired frequency; and

cycle stopping means for stopping the sequence means after the entire plurality of frequencies has been scanned once without actuation of the stopping means in order to return the tuner to the frequency to which the tuner was tuned when automatic scanning was initiated by actuation of the sequence means.

3,961,268

DISTURBANCE PULSE DETECTOR CIRCUIT FOR RADIO RECEIVER BLANKING

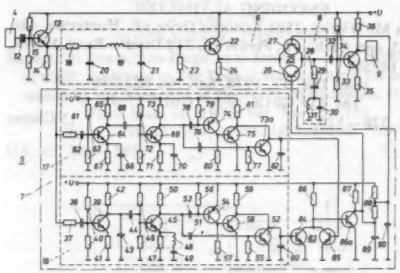
Jens Hansen, Hildesheim, Germany, assignor to Blaupunkt-Werke GmbH, Hildesheim, Germany

Filed June 30, 1975, Ser. No. 591,318

Claims priority, application Germany, Mar. 20, 1975, 2512239

Int. Cl.² H04B 1/10

U.S. Cl. 325—478 **11 Claims**



1. In an interference blanking circuit for a radio receiver which includes an interference detector circuit and a blanking switch interposed between the output of the demodulator of the receiver and the circuits for utilizing the demodulated signal, the improved interference detector circuit which comprises the combination of:

first disturbance recognition means (16) connected to the output of the demodulator and having a sensitivity maximum in a first frequency region lying slightly above the frequency band of the utilizable demodulated signal for recognizing the effects of a disturbance in said frequency region;

second disturbance recognition means (17) connected to the output of the demodulator for recognizing the high-frequency components of disturbances in a frequency region well above the frequency region in which said first disturbance recognition means is most sensitive, and

means connected to the outputs of said first and second disturbance recognition means for providing a blanking signal for operating the blanking switch of the receiver to interrupt the demodulated signal of the receiver only when both said first and said second disturbance recognition means (16, 17) recognize disturbance components in their respective frequency regions of sensitivity.

3,961,269

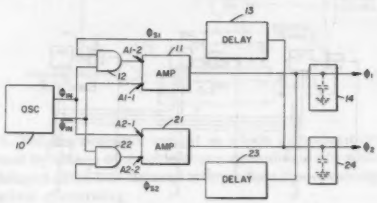
MULTIPLE PHASE CLOCK GENERATOR

Cesar E. Alvarez, Jr., Griffith, Ind., assignor to Teletype Corporation, Skokie, Ill.

Filed May 22, 1975, Ser. No. 579,759

Int. Cl.² H03K 1/00, 3/04; H03B 27/00

U.S. Cl. 328—62 **18 Claims**



1. A multiple-phase clock generator circuit for providing at least two clock phases, each consisting of an individual pulse train comprising:

means for producing a first input pulse train at a first node and a second input pulse train at a second node, the first and second input pulse trains being complementary;

first amplifier means for producing one of the clock phases;

first connection means for coupling the first and second nodes to the first amplifier means;

the first amplifier means being turned on to start a pulse of the one clock phase when a pulse from the first input pulse train is coupled to the first amplifier means, and the first amplifier means being turned off to end the pulse of the one clock phase when a pulse from the second input pulse train is coupled to the first amplifier means;

second amplifier means for producing another of the clock phases;

second connection means for coupling the first and second nodes to the second amplifier means;

the second amplifier means being turned on to start a pulse of the other clock phase when a pulse from the second input pulse train is coupled to the second amplifier means, and the second amplifier means being turned off to end the pulse of the other clock phase when a pulse from the first input pulse train is coupled to the second amplifier means;

feedback means for producing from the other clock phase at the output of the second amplifier means, a first control pulse train whose pulses are delayed by a first selected time from the end of the corresponding pulses of the other clock phase; and

said first connection means including means responsive to the control pulse train for coupling the first input pulse train at the first node to the first amplifier means only during the occurrence of the pulse of the first control pulse train;

whereby a pulse of the one clock phase will begin only the first preselected time after a pulse of the other clock phase has ended.

3,961,270

APPARATUS COMPRISING A PLURALITY OF SEPARATE PARTS, AND CONTROL APPARATUS FOR PRODUCING SYNCHRONIZING CONTROL SIGNALS FOR SAID SEPARATE PARTS

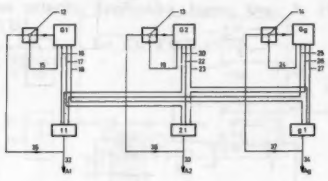
Werner Ullmann, Locarno; Renato Derighetti, Muralto, and Umberto Gagliati, Locarno, all of Switzerland, assignors to A.G. fur industrielle Elektronik AGIE Losone b. Locarno, Losone, Switzerland

Filed Nov. 7, 1974, Ser. No. 521,632

Claims priority, application Switzerland, Nov. 14, 1973, 15994/73

Int. Cl.² H03K *17/00, 17/26, 17/28*

U.S. Cl. 328—75 **16 Claims**



1. Control apparatus including a co-ordinated group of independently operable signal generators for producing output signals for control of separately controllable portions of an apparatus system with reliability-assurance redundance by means of independent electric signal supply circuits, said control apparatus comprising:

a number *g* of electric signal supply circuits, which number is greater by at least 1 than twice a chosen degree of redundance *r* of the signal generator group, each of said signal supply circuits containing:

an independently operable signal generator (**G1, G2** . . . *Gg*) for generating timing pulses (**S1***n*, **S2***n*, **Sg***n*; **S1***n*+1, **Sg***n*+1);

at least one gate circuit (**11, 21, *g*1, *a*1, *a*2, *ag***) for furnishing an output to a portion of said apparatus system, said gate circuit being responsive to the outputs of all the signal generators of the respective signal supply circuits for providing said output signals only when the number of said outputs of said signal generators with pulses (**S1***n*, **S2***n*; **S1***n*+1, **Sg***n*+1) timed within said predetermined interval (Δ*tn*, Δ*tn*+1) exceeds by at least 1 the said degree of redundance *r*, and

phase correcting circuit means (**12, 13, 14; 121, 131, 141**) for furnishing an output to said phase correcting circuit means (Δ*tn*, Δ*tn*+1) and having as inputs at least an input supplied by an output of said generator of the same signal supply circuit and an input supplied by the output of one of said gate circuits of the same signal supply circuit.

3,961,271

PULSE WIDTH AND AMPLITUDE SCREENING CIRCUIT

Valentine John Zlydak, Clark, and Maurice Leon Jezo, Cedar Grove, both of N.J., assignors to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Feb. 7, 1975, Ser. No. 547,835

Int. Cl.² H03K *5/20;* **G06G** *7/14*

U.S. Cl. 328—111 **13 Claims**

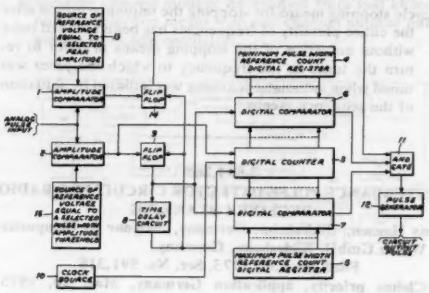
1. A pulse width and amplitude screening circuit to provide an output pulse for each input pulse whose amplitude and width fall within specified limits comprising:

a first source of said analog input pulses;

first means coupled to said first source to produce a first signal when the amplitude of one of said input pulses exceeds a first reference amplitude;

second means coupled to said first source to produce a second signal when the width of said one of said input pulses has an amplitude exceeding a second reference amplitude different than said first reference amplitude;

third means coupled to said second means to convert said second signal into a binary count, to produce a third signal when said count is greater than a minimum pulse



width reference count and to produce a fourth signal when said count is less than a maximum pulse width reference count; and

fourth means coupled to said first means and said third means responsive to the simultaneous presence of said first, third and fourth signals to produce said output pulse.

3,961,272

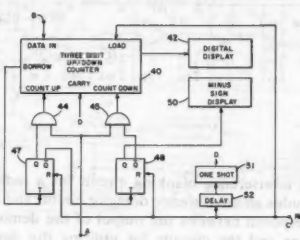
ENCODING ALTIMETER

Norman M. Witriol, 2501 Lancelot Drive SE, Huntsville, Ala. 35803, and Carlton L. Frederick, 518 Dryden Road, Ithaca, N.Y. 14850

Filed Dec. 17, 1974, Ser. No. 533,576

Int. Cl.² G01R *29/02;* **G01C** *21/00*

U.S. Cl. 328—129 **3 Claims**



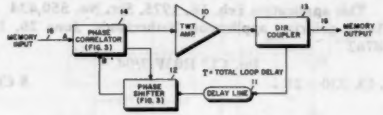
1. A system comprising a up/down counter having a countup input, a countdown input, a data input, a count output and a borrow output; first information means connected to the data in puts so as to store a first count in the counter; a second information means producing a second count in a form which said counter can count; a control circuit connecting said second information means to the countdown input; said control circuit being connected to the borrow output so as to switch the connections of the second information means to the countup input when an output is presented by said borrow output; said first and second information means produce outputs in a cyclic manner; reset signal means producing a signal output once each cycle; said up/down counter having a load input; said control means having a reset input; and said reset signal means being connected to the load input of the counter and to the reset input of the control means so as to allow the up/down counter to compare the counts of the first and second information means.

3,961,273

FREQUENCY MEMORY APPARATUS

Victor Trush, Nashua, N.H., assignor to Sanders Associates, Inc., Nashua, N.H.

Filed June 19, 1972, Ser. No. 264,123
Int. Cl.² H03B 3/04; H03K 5/18
U.S. Cl. 328—155 17 Claims



1. A frequency memory comprising

an amplifier and a delay line coupled in an oscillatory loop;

means for applying an input pulse of periodic signal to said loop, said loop responding thereto to recirculate said pulse;

means for correlating said input pulse with the first recirculated version of itself; and

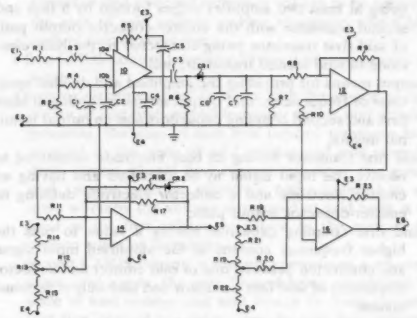
means responsive to said correlating means to adjust the phase delay of said loop in a direction to optimize the memory output power at the frequency of said periodic signal.

3,961,274

NOISE RIDING THRESHOLD

Robert W. Jones, San Diego, and James K. Hall, Santee, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 10, 1975, Ser. No. 557,191
Int. Cl.² H03B 1/04; H03K 5/08; H04B 1/10
U.S. Cl. 328—165 12 Claims



1. A network comprising:

isolation means for receiving an input signal having signal, DC and noise components and for outputting a negative level DC voltage proportional to the average value of the negative portion of said input signal noise component; and

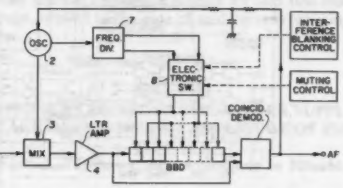
output means connected to said isolation means for adding a preset voltage to said negative level DC voltage and for providing a threshold voltage.

3,961,275

FM DISCRIMINATOR CIRCUIT

Hans-Hermann Kochsmeier, Hildesheim, Germany, assignor to Blaupunkt-Werke GmbH, Hildesheim, Germany

Filed May 21, 1975, Ser. No. 579,504
Claims priority, application Germany, June 5, 1974, 2427028
Int. Cl.² H03K 9/06
U.S. Cl. 329—107 6 Claims



1. FM discriminator circuit in which demodulation is obtained by means of a coincidence demodulator to which both a delayed and a non-delayed intermediate frequency signal are applied, comprising:

oscillator-mixer means (2,3) for subjecting the intermediate frequency signal to a frequency conversion additional to the frequency conversion used for tuning;

bucket brigade circuit means (5) for producing a delayed signal from an intermediate frequency signal which has been subjected to frequency conversion by said oscillator-mixer means, said bucket brigade circuit means (5) being controlled by pulses of a stepping feqeuency;

means, responsive to an output of the oscillator (2) of the oscillator-mixer means for providing said stepping frequency pulses to said bucket brigade circuit means, and

coincidence demodulator means and means for supplying said coincidence demodulator means with both delayed and undelayed intermediate frequency signals which have been subjected to frequency conversion by said oscillator-mixer means, said delayed signal being provided from the output of said bucket brigade circuit means and said undelayed signal being provided from the source of the input of said bucket brigade circuit means.

3,961,276

STEREO SIGNAL DEMODULATOR IN A FOUR-CHANNEL STEREO BROADCAST RECEIVER COMPRISING MEANS FOR PERFORMING DELAY EQUALIZATION TOGETHER WITH SAMPLING OF A COMPOSITE SIGNAL

Hirotaka Kurata, Tokyo, Japan, assignor to Sansui Electric Co., Ltd., Tokyo, Japan

Filed June 23, 1975, Ser. No. 589,263
Claims priority, application Japan, June 27, 1974, 49-72791
Int. Cl.² H03D 3/18
U.S. Cl. 329—112 19 Claims

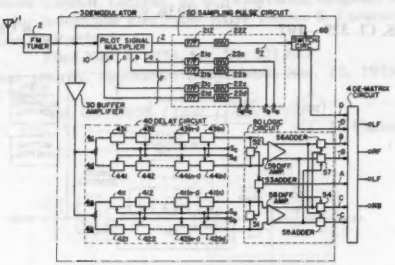
1. Apparatus for demodulating a composite signal from an FM tuner by sampling of said composite signal, said composite signal including a multi-channel signal and at least one pilot signal, said multi-channel signal including a main channel component, and first and second sub-channel components which are positioned at different frequency regions relative to each other, said second sub-channel component being different from said main channel component and from said first sub-channel component in delay time, comprising:

means receiving said composite signal,

sampling pulse means (10, 20; 70, 20) responsive to said pilot signal for producing first (S_a,S_b,S_c,S_d) and second (S_e) sampling pulse series which have different repetition frequencies,

delay means (40) comprising plural steps of electronic delay lines responsive to said composite signal and to said

first sampling pulse series (S_a,S_b,S_c,S_d), said plural steps of electronic delay lines being switched responsive to said first sampling pulse series to sample said composite signal at its first delay step and to subsequently shift the sampled values of said composite signal to the following delay step,



logic means (50) coupled to said delay means (40) and responsive to sampled values delayed by said delay means for demodulating said main channel component and said first sub-channel component, and

means (60) responsive to said second sampling pulse series (S_z) and to said composite signal for demodulating said second sub-channel component.

3,961,277

FREQUENCY DEMODULATOR, ESPECIALLY FOR DATA-TRANSMISSION SYSTEM

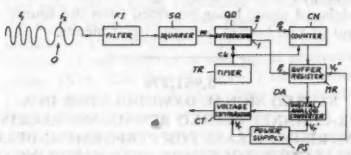
Umberto Rossi, Milan, and Pietro Basili, Pedaso, both of Italy, assignors to Societa Italiana Telecomunicazioni Siemens S.p.A., Milan, Italy

Filed Apr. 8, 1975, Ser. No. 566,130

Claims priority, application Italy, Apr. 8, 1974, 21025/74

Int. Cl.² H03D *3/20*

U.S. Cl. 329—128 **7 Claims**



1. A demodulator for an incoming oscillation including a succession of distinct signal frequencies, comprising:

wave-shaping means for converting said oscillation into a square wave;

differentiation means connected to said wave-shaping means for deriving from each discontinuity in the voltage of said square wave a pair of closely spaced trigger pulses following each other within a small fraction of a cycle of the highest signal frequency to be demodulated;

a source of clock pulses having a cadence which is high compared with said highest signal frequency;

a pulse counter connected to said source for stepping by said clock pulses;

storage means connected to said pulse counter for receiving the reading thereof;

a digital/analog converter connected to said storage means for energization by the contents thereof, said storage means being connected to said differentiation means for enablement by the first trigger pulse of each pair to transfer the reading of said pulse counter to said converter, said pulse counter being connected to said differentiation means for resetting by the second trigger pulse of each pair immediately after each transfer; and

threshold means connected to said converter for comparing the output thereof with a fixed reference voltage.

3,961,278

TRANSISTOR AMPLIFIER

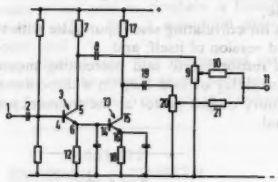
Robert Ronald Laupman, Wijchen, Netherlands, assignor to Novanex Automation N.V., Wijchen, Netherlands

Continuation of Ser. No. 372,998, June 25, 1973, abandoned. This application Feb. 18, 1975, Ser. No. 550,434

Claims priority, application Netherlands, June 26, 1972, 7208762

Int. Cl.² H03F *3/04*

U.S. Cl. 330—21 **8 Claims**



1. A transistor amplifier system for amplifying and dividing a spectrum of frequencies contained in an input signal, comprising in combination:

a plurality of transistor amplifier stages connected in cascade, each stage including a transistor having a base electrode and an emitter-collector output path, there being at least two amplifier stages formed by a first and second transistor with the emitter-collector output path of said first transistor being connected to the base electrode of said second transistor; and

output means for providing the amplified and divided spectrum of frequencies, said output means including at least first and second coupling capacitors and an output terminal means;

said first transistor having its base electrode connected to receive the input signal to be amplified and having an emitter electrode and a collector electrode defining its emitter-collector output path;

said first coupling capacitor having a value to pass the higher frequency content of the amplified input signal and connected between one of said emitter and collector electrodes of said first transistor and said output terminal means;

said second transistor having its base electrode connected with that electrode of the emitter-collector output path of said first transistor which is not connected with said first coupling capacitor so as to be biased predominantly by lower frequencies of the input signal, and having an emitter electrode and a collector electrode defining its emitter-collector output path; and

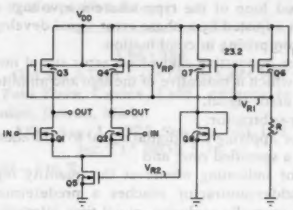
said second coupling capacitor having a value to pass said lower frequencies of the amplified input signal and connected between one of said emitter and collector electrodes of said second transistor and said output terminal means.

3,961,279

CMOS DIFFERENTIAL AMPLIFIER CIRCUIT UTILIZING A CMOS CURRENT SINKING TRANSISTOR WHICH TRACKS CMOS CURRENT SOURCING TRANSISTORS

Clark W. Davis, Saratoga, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Jan. 29, 1975, Ser. No. 545,097
Int. Cl.² H03F 3/16, 3/45
U.S. Cl. 330—30 D 18 Claims



1. A CMOS differential amplifier circuit including a first and second branch circuit, said amplifier circuit comprising:

a first CMOS amplifier transistor a source, a drain and a gate, the source to drain circuit thereof being in said first branch circuit of said amplifier,

a second CMOS amplifier transistor comprising a source, a drain, and a gate, the source to drain circuit thereof being in said second branch circuit of said amplifier parallel to said first branch circuit,

a CMOS current sourcing transistor having a source, a drain, and a gate, the source to drain circuit thereof being coupled to the source to drain circuit of said first amplifier transistor in said first branch circuit,

a CMOS current sinking transistor having a source, a drain, and a gate, the source to drain circuit thereof being coupled in common to the source to drain circuits of said two amplifier transistors,

a source of electrical potential, said two branch circuits and the source to drain circuit of said current sinking transistor being coupled in series across said source of potential,

and a CMOS control circuit for providing a first reference voltage to be applied to the gate of said current sourcing transistor and a second reference voltage to be applied to the gate of said current sinking transistor, said CMOS control circuit comprising;

a first CMOS control transistor having a source, a drain, and a gate,

a resistor circuit coupled in series with the source to drain circuit of said first control transistor across said source of potential, the gate of said first control transistor being coupled to the node of said resistor and said source to drain circuit of said first control transistor, the gate of said current sourcing transistor being coupled to said node whereby the voltage developed at said node is utilized as the first reference voltage to the gate of said current sourcing transistor,

a second CMOS control transistor comprising a source, a drain, and a gate, the gate thereof being coupled to the node of said resistor and said source to drain circuit of said first control transistor whereby said first reference voltage is applied to the gate of said second control transistor,

and a third CMOS control transistor having a source, a drain, and a gate, the source to drain circuit of said third control transistor being coupled in series with the source to drain circuit of said second control transistor across said source of potential, the gate of said third control transistor being coupled to the node of the source to drain circuits of said second control transistor and said third control transistor, the gate of said current sinking transistor being coupled to the node of said source to drain circuits of said second and third control transistors whereby the voltage developed at said node is utilized as the second reference voltage to the gate of said current sinking transistor,

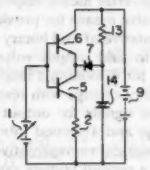
the ratios of the channel widths of said three control transistors, said current sourcing transistor, and said current sinking transistor being such that the value of the second reference voltage applied to the gate of the current sinking transistor produces a current limiting value therein which is about twice the current limiting value produced in said current sourcing transistor by said first reference voltage applied to the gate of said current sourcing transistor.

3,961,280

AMPLIFIER CIRCUIT HAVING POWER SUPPLY VOLTAGE RESPONSIVE TO AMPLITUDE OF INPUT SIGNAL

Tohru Sampei, Toyokawa, Japan, assignor to Hitachi, Ltd., Japan

Filed Aug. 23, 1974, Ser. No. 499,916
Claims priority, application Japan, Aug. 25, 1973, 48-94861
Int. Cl.² H03F 3/04
U.S. Cl. 330—40 6 Claims



1. An amplifier circuit of a high efficiency adopted to be used as an output circuit of an amplifier, said amplifier circuit comprising:

a first transistor for amplifying an incoming input signal applied to a base of said first transistor;

means for connecting an emitter of said first transistor to a reference potential point through means for passing a DC current;

a second transistor having a base receiving said incoming input signal applied to the base of said first transistor and an emitter connected to a collector of said first transistor;

a single power source for applying a bias voltage to each of said first and second transistors;

means for connecting a collector of said second transistor to said power source;

a series connection of a resistance element and a capacitive element connected in parallel with said power source, said capacitive element being provided on the side of said reference potential point;

a diode connected between the junction point between the collector of said first transistor and the emitter of said second transistor and the junction point between said resistance element and said capacitive element; and

a load connected to the emitter of said first transistor.

3,961,281

DIGITAL CONTROL SYSTEM

Kenneth Rau Woolling, Jr., Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

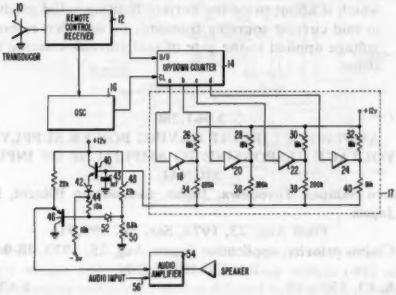
Filed May 23, 1975, Ser. No. 580,680
Int. Cl.² H03G 3/00
U.S. Cl. 330—129 4 Claims

1. Apparatus responsive to transmitted remote control signals for providing a control voltage suitable for controlling the gain of a voltage controlled amplifier comprising:

receiving means responsive to said transmitted control signals for providing actuating signals;

pulse generating means responsive to said actuating signals for providing a series of output pulses;

counting means responsive to pulses from said generating means for providing numerical representative binary coded output signals;



digital-to-analog converter means responsive to signals from said pulse responsive means for providing an output voltage level representative of said binary coded signals; and

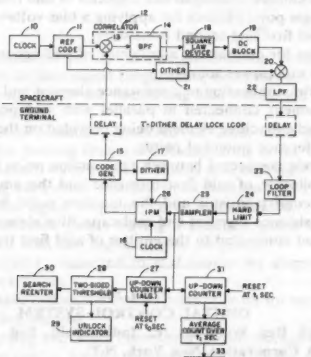
means responsive to said output voltage level from said converter means for providing a modified output voltage having a first rate of change with respect to said numerical representative signals for output voltage levels of a first voltage range and a second rate of change with respect to said numerical representative signals for output voltage levels of a second voltage range.

3,961,282

TRACKING STATUS DETECTOR FOR A DIGITAL DELAY LOCK LOOP

Chang Chung Chen, Harbor City; Jack K. Holmes, Los Angeles, and James L. Lewis, Torrance, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 28, 1975, Ser. No. 572,557
Int. Cl.[2] H03B *3/04*
U.S. Cl. 331—1 R **9 Claims**



3. In a method for monitoring the tracking status of a digital phase-locked loop which contains an incremental phase modulator which periodically makes positive and negative adjustments to the pulses generated within said loop so as to increase or decrease their lengths by fractional amounts, the steps of

determining the algebraic sum of the positive and negative adjustments that are made during successive time intervals of equal lengths; and

indicating whenever this sum attains a particular threshold value which is selected to correspond to a specific amount of misalignment between the pulses being phase locked.

7. Apparatus for monitoring the tracking status of an analog phase-locked loop of the type wherein a voltage controlled oscillator is adjusted by a phase error signal developed within the loop, comprising in combination

means for converting said phase error signal into a digital signal which is indicative of the sign and amplitude of said phase error signal;

an adder-subtractor;

means for applying said digital signal to said adder-subtractor at a specified rate; and

means for indicating whenever the quantity registered in said adder-subtractor reaches a predetermined value within mutually exclusive, equal time intervals.

9. Apparatus for monitoring the tracking status of an analog phase-locked loop of the type that has a voltage controlled oscillator therein which is regulated by a phase error signal whose sign and amplitude represent the direction and amount of phase displacement between the two signals involved in the phase-locked process, comprising

means for converting said phase error signal into a one-bit binary code,

said bit being positive or negative depending upon the sign of said phase error signal;

an up-down counter; and

means for feeding said one-bit binary code to said up-down counter at a rate governed by the amplitude of said phase error signal;

means for periodically resetting said up-down counter to zero; and

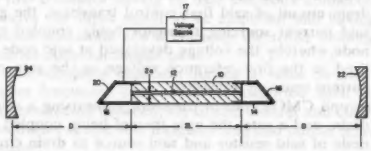
means for providing an indication whenever the count registered in said up-down counter reaches a preselected threshold value.

3,961,283

WAVEGUIDE GAS LASER WITH WAVELENGTH SELECTIVE GUIDE

Richard L. Abrams, Pacific Palisades, and Arthur N. Chester, Malibu, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Mar. 14, 1975, Ser. No. 558,612
Int. Cl.[2] H01S *3/03*
U.S. Cl. 331—94.5 C **9 Claims**



1. A gas laser comprising:

a waveguiding member defining a capillary bore of radius *a* and length 2L,

a laser gas disposed within said bore and having a laser transition capable of providing stimulated emission of light at wavelength λ,

means in association with said waveguiding member for providing an enclosure for said laser gas,

means for exciting said laser gas to invert the population of the energy levels of said laser transition,

optical resonator means for reflecting light of wavelength λ back and forth through said capillary bore; and

said bore radius a and length $2L$ and said wavelength λ each being of a preselected value satisfying the relation

$$\frac{a^2}{\lambda L} = \frac{1}{8N},$$

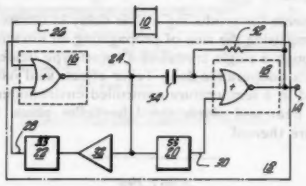
where N is a positive integer.

3,961,284

OSCILLATOR CONTROL CIRCUIT

Laurence Paul Flora, Covina, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Aug. 1, 1975, Ser. No. 601,198
Int. Cl.² H03B 5/36
U.S. Cl. 331—116 R **9 Claims**



1. In an oscillator for which output is sustained by a feedback path for a harmonic-rich oscillating element, a frequency determining circuit in the feedback path, comprising:

a pair of single-shot multivibrators having relaxation periods between a quarter-period and a half-period of a desired oscillation harmonic and responsive to transitions in the output of the element, the first responsive to transitions to one polarity and the second responsive to transitions to the opposite polarity;

summing means for the output of each said multivibrator and the output of the element corresponding thereto; and

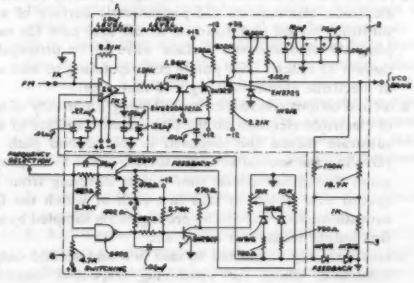
means to connect the output of said summing means as feedback excitation for the element.

3,961,285

VOLTAGE CONTROLLED OSCILLATOR DRIVER

Ronald H. Jelinek, Pine Brook, N.J., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Sept. 23, 1971, Ser. No. 183,121
Int. Cl.² H03C 3/00
U.S. Cl. 332—16 T **3 Claims**



1. A circuit for driving a voltage controlled oscillator which is to be switched between two preset variable frequencies and for simultaneously imposing frequency modulation about a selected center frequency comprising:

low level amplifying means having two inputs, one of said inputs being connected to a frequency modulating signal and having an output for driving a voltage controlled oscillator;

high level amplifying means having an input coupled to the output of said low level amplifying means;

a feedback circuit having an input coupled to the output of said high level amplifying means, said feedback circuit for generating a controlling DC voltage which is applied to the other input of said low level amplifying means; and

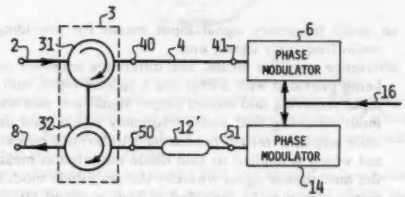
means for changing the output of said feedback network as a function of frequency.

3,961,286

REFLECTION TYPE PHASE MODULATOR HAVING REDUCED TEMPERATURE SENSITIVITY AND REDUCED DISTORTION

Young Dae Kim, Mountain View, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Mar. 10, 1975, Ser. No. 557,197
Int. Cl.² H03C 3/20
U.S. Cl. 332—22 **6 Claims**



1. A phase modulator comprising:

four port circulating means having a first port for receiving an applied carrier signal, a second port for supplying a phase modulated signal, a third port and a fourth port;

first phase modulating means having a modulation signal input and a signal port with a first reflection coefficient for phase varying a signal applied to the signal port in response to a modulating signal applied to the modulation signal input;

second phase modulating means having a modulation signal input and a signal port with a second reflection coefficient for phase varying a signal applied to the signal port in response to a modulating signal applied to the modulation signal input;

means for connecting the third port of the circulating means to the signal port of the first phase modulating means; and

means coupled to the fourth port of the circulating means and to the signal port of the second phase modulating means for causing the second reflection coefficient of the second signal port to be equal in magnitude with the first reflection coefficient of the first signal port and substantially 180° different in phase.

3,961,287

AMPLITUDE MODULATED TRANSMITTER

John Cacciola, Ardsley, and David W. Thomas, Lederach, both of Pa., assignors to PRF, Inc., Lansdale, Pa.

Filed Apr. 16, 1975, Ser. No. 568,802
Int. Cl.² H03C 1/06
U.S. Cl. 332—37 D **7 Claims**

1. An amplitude modulated transmitter, comprising:

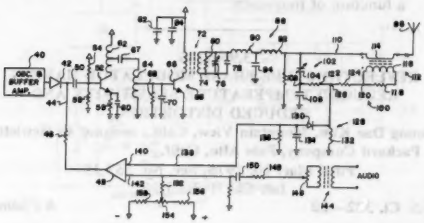
means for providing a carrier frequency signal at an output;

diode modulation means connected in series with the output of said carrier frequency means for modulating the car-

rier frequency signal in response to a modulation signal which varies the bias of said diode modulation means;

amplifier means, said amplifier means receiving the modulated carrier frequency signal and amplifying the same to provide an amplified output signal;

directional coupler sampler means connected to the output of said amplifier means, said directional coupler means including voltage coupling means, current coupling means, and signal processing means responsive to said voltage and current coupling means for providing a sensed output signal proportional to the modulation output of said amplifier means;



an audio frequency signal input means for providing an audio frequency signal; and

difference amplifier means, said difference amplifier means being provided with a first and a second input, said first input receiving said sensed output signal and said second input receiving said audio frequency signal, said difference amplifier means producing a difference output signal which is applied to said diode modulation means as the modulation signal whereby the amplitude modulated transmitter may be operated at high levels of efficiency with a minimum of distortion.

3,961,288

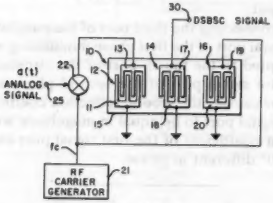
DOUBLE SIDEBAND SUPPRESSED CARRIER MODULATOR USING SURFACE WAVE DEVICE

Robert S. Gordy, Largo, Fla., assignor to NCR Corporation, Dayton, Ohio

Filed Apr. 28, 1975, Ser. No. 570,145

Int. Cl.² H03C 1/46, 1/52

U.S. Cl. 332—44 **17 Claims**



16. A method for generating a double sideband suppressed carrier signal comprising the following steps:

generating a first acoustic signal from a carrier signal;

generating a second acoustic signal from a modulated carrier signal;

combining the first and second acoustic signals; and

deriving a double sideband suppressed carrier signal from the combined first and second acoustic signals.

3,961,289

ULTRASONIC DELAY MATERIAL

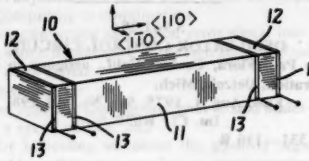
Yoshihiro Kino, Kawasaki, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Japan

Continuation-in-part of Ser. No. 340,458, March 12, 1973, abandoned. This application Aug. 30, 1974, Ser. No. 502,187

Claims priority, application Japan, Mar. 15, 1972, 47-27035

Int. Cl.² H03H 9/26, 9/30

U.S. Cl. 333—30 R **10 Claims**



1. A process for producing a time delay in ultrasonic wave signals comprising the step of propagating an ultrasonic wave signal through a single crystal of a spinel-type oxide material exhibiting a cooperative Jahn-Teller effect, said oxide being maintained in a temperature-controlled environment at temperatures near and above the Jahn-Teller phase transition temperature thereof.

3,961,290

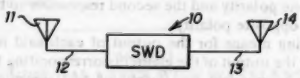
PROGRAMMABLE PHASE CODED SURFACE WAVE DEVICE

Samuel D. Moore, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Feb. 7, 1975, Ser. No. 547,900

Int. Cl.² H03H 9/26, 9/30, 9/32; H03K 13/02

U.S. Cl. 333—30 R **12 Claims**



1. An acoustic surface wave programmable processor comprising:

substrate means having at least a surface layer of piezoelectric material,

means to produce respective first and second acoustic surface waves of opposite phase wherein the second acoustic surface wave is at least substantially the inverse of the first acoustic surface wave in the piezoelectric material of said substrate means and propagating along two distinct paths,

a first output transducer array having a plurality of sets of electrode elements on the piezoelectric surface of said substrate means and disposed in the first path for sampling the first acoustic surface wave to be propagated therein at spaced time points corresponding to said sets of electrode elements along said first path,

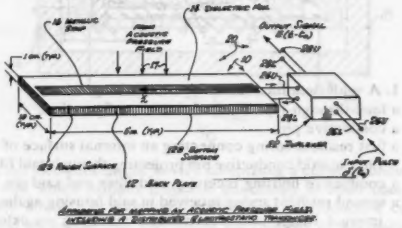
a second output transducer array having a plurality of sets of electrode elements on the piezoelectric surface of said substrate means and disposed in the second path for sampling the second acoustic surface wave to be propagated therein at spaced time points differing from the spaced time points in said first path at which the first acoustic surface wave to be propagated is sampled by said first output transducer array, and

means operably connected to said first and second output transducer arrays for combining respective electrical output signals from sets of electrode elements at successive time points along said first and second paths from said first and second output transducer arrays.

3,961,291
APPARATUS AND METHOD FOR MAPPING ACOUSTIC FIELDS

Harper John Whitehouse, and Tibor G. Horwath, both of San Diego, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Division of Ser. No. 319,124, Dec. 29, 1972, Pat. No. 3,868,624. This application Nov. 29, 1974, Ser. No. 528,176
Int. Cl.² H01P 3/08; H04B 13/00; H03H 9/00
U.S. Cl. 333—31 R 3 Claims



1. Apparatus useful for mapping acoustic pressure fields, P ($\underline{k}$,w), where $\underline{k}$ is a wave vector and w is frequency, comprising:

a distributed electrostatic transducer, functioning as a strip transmission line, which includes;

a flat, substantially rectangular, metal plate, one surface of which is rough, the plate having a length generally in the range of 10 to 100 wavelengths of the acoustic frequency at which the mapping is to be done, and a width and thickness in the range of 0.05λ and 0.01λ;

a rectangular strip of dielectric foil disposed under surface tension on the rough surface of substantially the entire metal plate so that the foil touches only the most protruding parts of the surface; and

a long, narrow, rectangular, metallic strip disposed on and attached to the dielectric foil, the strip being exposed to, and therefore defining, an acoustic pressure field; and

a duplexer, electrically connected to the metallic strip and to the flat plate, connectable to a a source of electrical input signals, and having output terminals at which an output electrical signal may be measured;

with the result that, when an electromagnetic delta function $\delta(t_o)$ is applied at the input to the duplexer, electromagnetic waves travel in both directions along the strip transmission line, the duplexer having the function of separating the signal reaching the output terminals of the duplexer from the applied signal $E(t-t_o)\ \delta(t_o)$ which is interrogating the strip line, the first mentioned signal containing two groups of frequencies:

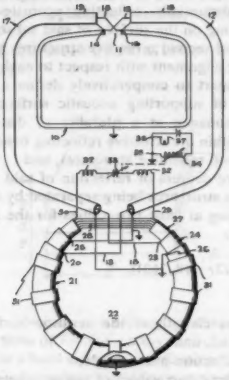
1. low frequency components w_a identical to those present in the acoustic pressure field, and

2. high-frequency components containing the wave vectors $\underline{k}_a$, also present in the acoustic pressure field, the two components being readily separable, because of the great differences in their frequencies, and hence the pressure field $P(k,w)$ may be reconstructed.

3,961,292
RADIO FREQUENCY TRANSFORMER

Ross Alan Davis, 724 Ala Moana Blvd., Honolulu, Hawaii 96813

Continuation of Ser. No. 430,095, Jan. 2, 1974, abandoned. This application May 19, 1975, Ser. No. 578,642
Int. Cl.² H03H 7/38; H01Q 1/32
U.S. Cl. 333—32 7 Claims



1. A radio-frequency transformer system, including:

a source of push-pull radio-frequency signals having first and second output terminals at respective ones of which radio-frequency signals of substantially equal amplitude but opposite phase appear;

a transformer primary having first and second hollow tubular portions, said second portion being nested within but electrically insulated from said first portion; and,

a secondary winding including multiple turns of an electrical conductor passing through the inner opening of said second portion of said primary;

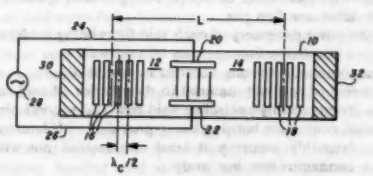
said first and second portions of said primary each having a first and a second end, said first end of said first portion being coupled to said first output terminal, said first end of said second portion being coupled to said second output terminal;

said first end of said first portion being juxtaposed to said second end of said second portion and said first end of said second portion being juxtaposed to said second end of said first portion.

3,961,293
MULTI-RESONANT SURFACE WAVE RESONATOR

Clinton S. Hartmann, Richardson, and Jeffrey Stuart Schoenwald, Dallas, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Feb. 3, 1975, Ser. No. 546,358
Int. Cl.² H03H 9/02, 9/20, 9/26, 9/32
U.S. Cl. 333—72 19 Claims



1. A surface wave multi-resonant device comprising:

substrate means having at least a surface layer of piezoelectric material,

acoustic surface wave transducer means disposed on said piezoelectric surface of said substrate means and being operable to convert an input electrical signal to acoustic surface waves propagating on said piezoelectric surface of said substrate means,

means defining first and second reflective structures on the piezoelectric surface of said substrate means for respectively substantially reflecting acoustic surface waves propagating on the surface of said substrate means,

said first and second reflective structures being disposed in opposing alignment with respect to each other and being spaced apart to cooperatively define a resonant cavity capable of supporting acoustic surface wave standing wave resonance at a plurality of distinct frequencies falling within the effective reflecting bandpass of said first and second reflective structures, and

the effective centers of reflection of said first and second reflective structures being separated by a distance L and there being at least two values for the integer N in the equation:

$$L = \lambda[(N/2) - (\theta_r/360)],$$

where

λ is the wavelength of the acoustic surface wave being propagated, and

θ_r is the reflection phase angle,

such that at least two values of the wavelength θ correspond to surface wave frequencies falling within the effective reflecting bandpass of said first and second reflective structures.

3,961,294

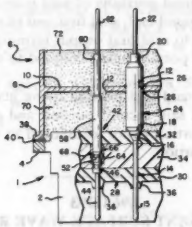
CONNECTOR HAVING FILTER ADAPTOR

Robert David Hollyday, Hershey, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Apr. 21, 1975, Ser. No. 569,919

Int. Cl.² H03H *7/04, 7/14;* **H01R** *25/08, 3/06*

U.S. Cl. 333—79 **4 Claims**



1. A connector, comprising:

a conducting shell having an interior web provided with apertures therethrough,

first and second conductive pins freely received through said apertures,

an electrical filter of sleeve configuration soldered over at least one first pin,

the outer periphery of each said filter being soldered within a corresponding aperture of said web,

a connector housing secured to said shell,

a seal of resilient material in the interior of said connector compressibly encircling said first and second pins,

said connector housing being provided with latching means latchably securing at least one second pin within said connector housing, and

encapsulant material in said shell encircling said first and second pins and separating each said second pin from said web.

3,961,295

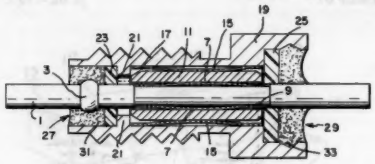
SOLDERLESS FILTER ASSEMBLY

Robert David Hollyday, Hershey, Pa., and Jack Leo Bradbery, Evergreen Park, Ill., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Mar. 25, 1975, Ser. No. 561,808

Int. Cl.² H03H *7/04;* **H01G** *4/42*

U.S. Cl. 333—79 **2 Claims**



1. A solderless filter assembly, comprising:

a feed-through type filter of sleeve configuration,

a conductive pin,

a first resilient spring connecting an internal surface of said filter to said conductive pin projecting through said filter,

a conductive housing receiving said filter and said pin,

a second resilient spring received in said housing against an internal flange and electrically connecting an external surface of said filter with an internal surface of said housing,

opposite ends of said housing being provided with corresponding recesses,

opposite ends of said pin projecting outwardly of said recesses,

nonconductive sealing means press-fit internally of each recess and in encirclement about said pin for sealing said filter and said first and second springs internally of said housing, and

nonconductive potting material in said recesses provided in said housing bonded to said housing and bonded in encirclement about said pin.

3,961,296

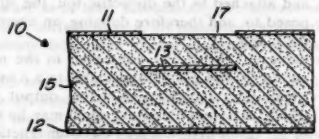
SLOTTED STRIP-LINE

James T. Wiggenhorn, Coral Springs, Fla., assignor to Motorola, Inc., Chicago, Ill.

Filed Mar. 6, 1975, Ser. No. 555,930

Int. Cl.² H01P *3/08*

U.S. Cl. 333—84 M **10 Claims**



1. An improved strip-line transmission line comprising:

a. first and second spaced apart ground planes formed of parallel, coextensive sheets of conductive material;

b. a center conductor positioned between said first and second ground planes and extending from one end of the transmission line to the other, parallel with said ground planes and spaced therefrom;

c. a dielectric material filling the volume between said ground planes and fixedly engaging said first and second ground planes and said center conductor; and

d. an elongated channel formed in one of said first and second ground planes in overlying relationship to said center conductor, said channel extending the length of

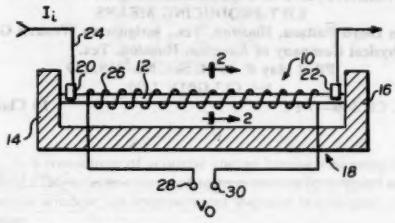
said center conductor, and the width of said channel being adjusted to introduce a predetermined impedance in the transmission line throughout the length thereof.

3,961,297

ELECTROMAGNETIC ANISOTROPIC DEVICES

Ivan J. Garshelis, 61 Oleander Way, Clark, N.J. 07066

Filed July 12, 1974, Ser. No. 488,209
Int. Cl.² H01H 55/00
U.S. Cl. 335—3 5 Claims



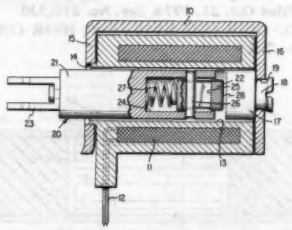
1. An electromagnetic device comprising a current conductive rod which exhibits magnetic anisotropy in other than a purely circular or longitudinal direction, a conductive coil wound about said rod, and means for applying an alternating current through said rod of sufficient magnitude to produce a helical magnetization of said rod in a given direction during one half-cycle of said current and for reversing the direction of said helical magnetization during the next half cycle of said current, whereby to produce a change in the linkage of axial flux in said rod with said conductive coil to cause an AC output signal at the terminal thereof.

3,961,298

DUAL PLUNGER SOLENOID

Wolfgang Jaffe, Roselle Park, and Oswald M. Porter, Livingston, both of N.J., assignors to The Singer Company, New York, N.Y.

Filed May 7, 1975, Ser. No. 575,282
Int. Cl.² H01F 7/18
U.S. Cl. 335—259 4 Claims



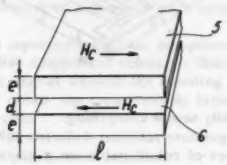
1. A solenoid having a current carrying coil and an armature assembly located within and movably longitudinally of said coil, said armature assembly including a primary plunger and at least one secondary plunger telescopically arranged and mechanically interconnected with said primary plunger for limited axially movement relative to the primary plunger and having its end portion normally projecting beyond the end portion of said primary plunger for movement in the same air gap as that traversed by the primary plunger upon energization of the solenoid, said mechanical interconnection between said primary and secondary plungers being such that the initial movement of said second plunger exerts an immediate pulling force on said primary plunger.

3,961,299

MAGNETIC CIRCUIT HAVING LOW RELUCTANCE

Jean-Pierre Lazzari, Seyssinet, and Igor Melnick, Grenoble, both of France, assignors to Commissariat a l'Energie Atomique, Paris and Compagnie Internationale pour l'Informatique, Louveciennes, both of, France

Continuation of Ser. No. 294,601, Oct. 3, 1972, abandoned, which is a continuation of Ser. No. 81,887, Oct. 19, 1970, abandoned. This application Nov. 5, 1973, Ser. No. 412,544
Claims priority, application France, Oct. 28, 1969, 69.36864
Int. Cl.² H01F 27/24; G11B 5/16
U.S. Cl. 336—218 2 Claims



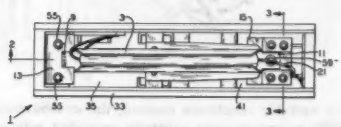
1. A magnetic element comprising an alternate stack of anisotropic thin films of Fe-Ni-Cr alloy having an easy axis of magnetization and a hard axis of magnetization, a demagnetizing field and a coercive field and of non-magnetic insulating thin films, the demagnetizing field of two successive films of Fe—Ni—Cr being in opposite directions, said Fe—Ni—Cr films being even in number and said non-magnetic insulating films having a thickness providing a value of the difference between the emagnetizing fields of two successive films of Fe—Ni—Cr alloy equal at a maximum to the value of the coercive field of each Fe—Ni—Cr film.

3,961,300

THERMAL TIMER, THERMAL ACTUATOR, CONTROL SYSTEM AND CIRCUIT

Stanley J. Budlane, Fulton, Ill., assignor to General Electric Company, Fort Wayne, Ind.

Filed June 18, 1974, Ser. No. 480,562
Int. Cl.² H01H 37/02
U.S. Cl. 337—303 12 Claims

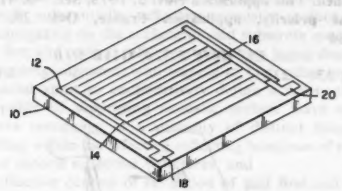


1. A thermal timer comprising a housing, means responsive to oppositely acting thermal differentials established thereacross for pivotally moving generally in opposite directions through a predetermined timed cycle including a pair of generally elongate metallic strips disposed at least in part in spaced overlaying relation with each other, a pair of opposite end portions on each of said strips, one of said opposite end portions of said strips being interconnected, and means fixedly connected between the other of said opposite end portions for spacing them apart so that said spacing means and said strips constitute a generally triangularly shaped integral truss, means for mounting only said spacing means to said housing so that said strips may pivotally move generally in the opposite directions about said spacing means, and a pair of means respectively associated with said strips and adapted to be energized for alternately heating said strips to establish the thermal differentials thereacross and effect the pivotal movement of said strips in the opposite directions about said spacing means and through the predetermined timed cycle.

3,961,301
HUMIDITY SENSOR

Anthony V. Fraioli, Essen Fells, N.J., assignor to Plessey Incorporated, Melville, N.Y.

Filed Dec. 13, 1973, Ser. No. 426,953
Int. Cl.² H01C 13/00
U.S. Cl. 338—35 5 Claims

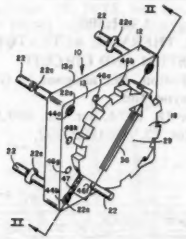


1. A humidity sensor comprising:
a high-temperature resistant dielectric substrate;
a fired layer of cobalt oxide on a major surface of said substrate;
a pair of electrodes in contact with said cobalt oxide; and
a porous, non-wettable coating covering at least said cobalt oxide layer.

3,961,302
VARIABLE RESISTANCE CONTROL

James N. Hufford, Elkhart, Ind., assignor to CTS Corporation, Elkhart, Ind.

Filed Nov. 15, 1974, Ser. No. 524,089
Int. Cl.² H01C 10/34
U.S. Cl. 338—174 9 Claims

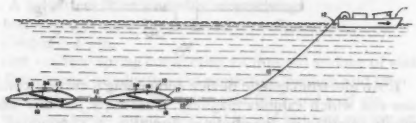


1. In a variable resistance control, the combination of an electrically nonconductive substrate provided with an aperture and a plurality of sets of locator means disposed around the periphery of the substrate, each of said locator means in the set being equidistant from the next closest locator means in the set, the first set of said locator means being disposed in the corners of the substrate a first distance from said aperture, the remainder set of said locator means being symmetrically disposed about the aperture a second distance from said aperture, said first distance being greater than said second distance, resistance means supported on a first surface of the substrate, an electrically conductive collector carried on said first surface of the substrate, adjusting means rotatably secured to the substrate, a projection connected to the adjusting means and extending radially outwardly from the adjusting means, an electrically conductive contactor constrained to move with the adjusting means and wipably engaging the resistance means and the collector, the contactor being electrically insulated from the adjusting means, a plurality of terminal members disposed in a predetermined number of said first set of locator means and in a predetermined number of said remainder set of said locator means, the terminal members being electrically connected to the resistance means and to the collector, said terminal members electrically connecting the variable resistance control to an external circuit, the terminal member disposed in the remainder set of said locator means being in an interference path with said projection and comprising an engagement portion extending above said first surface.

3,961,303
DEPTH CONTROLLERS WITH CONTROLLABLE NEGATIVE AND UNCONTROLLABLE POSITIVE LIFT-PRODUCING MEANS

John Lloyd Paitson, Houston, Tex., assignor to Western Geophysical Company of America, Houston, Tex.

Filed May 8, 1974, Ser. No. 468,129
Int. Cl.² G01V 1/00
U.S. Cl. 340—7 PC 10 Claims

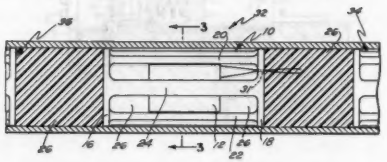


1. A depth controller for controlling the depth at which an object coupled to the controller is towed in a body of water, said controller comprising:
a streamlined body;
depth control elements movably mounted in said body to produce only negative lift; and
depth control means including means operatively coupled to said elements to extend and retract them from and into said body in dependence upon the depth of the controller in said water.

3,961,304
DECOUPLED HYDROPHONE WITH REDUCED RESPONSE TO VIBRATION AND STRESS CONCENTRATION

Henry P. Bakewell, Jr., Old Saybrook, Conn., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 21, 1974, Ser. No. 516,330
Int. Cl.² G01V 1/00; H04B 13/00; H04R 15/00
U.S. Cl. 340—7 R 7 Claims

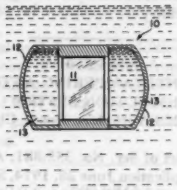


1. An acoustic array including a longitudinal tube having a plurality of hydrophone assemblies mounted therein, each of said hydrophone assemblies comprising:
a structure including a plurality of longitudinally disposed ribs secured by a pair of discs at the ends thereof;
an electro-acoustic transducer element housed in said structure; and
an elastic fill material for maintaining said transducer element in place in said structure, said fill material being potted in said structure, thereby reducing vibration and flow noise, and enhancing mechanical protection.

3,961,305
FLUID FOR FILLING SONAR TRANSDUCERS

Charles E. Green, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 14, 1975, Ser. No. 550,067
Int. Cl.² H04B *13/00*
U.S. Cl. 340—8 LF **2 Claims**



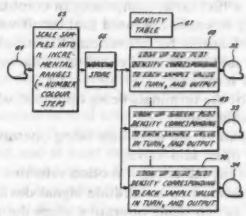
1. In a transducer of acoustic energy having a housing containing a ferroelectric element to be acoustically coupled to an acoustic window, an improvement therefor is provided comprising:

polyakylene glycol having acoustic properties making its velocity of sound propogation nearly equal to that of water, its density nearly equal to water, its acoustic impedance nearly equal to water and its signal attenuation nearly negligable, chemical properties ensuring long time stability and compatibility with other transducer materials, physical properties making its viscosity lower only thirty centistokes from zero to twenty degrees centigrade, and environmental properties allowing safe handling, fills the housing and all voids therein for acoustically coupling the active element to the acoustic window.

3,961,306
METHOD OF FORMING COLOR GRAPHIC DISPLAYS FROM INPUT DATA

Nigel A. Anstey, Sevenoaks, England, assignor to Seiscom Delta Inc.

Division of Ser. No. 300,718, Oct. 25, 1972, abandoned. This application May 23, 1975, Ser. No. 580,437
Claims priority, application United Kingdom, Oct. 28, 1971, 50199/71
Int. Cl.² G01V *1/34*
U.S. Cl. 340—15.5 DS **28 Claims**



1. A method of forming color graphic displays directly from a sequence of input digital data values, wherein differing colors at data display points in the color displays are quantitatively indicative of differing values or ranges of values of the digital data, comprising:

a. forming an assignment table comprised of a set of numerical codes referenced as a two-dimensional matrix wherein one dimension of the matrix represents sample values of the data to be displayed, each sample value representing an assigned range from a plurality of ranges into which the input data values are partitioned, and the other dimension of the matrix representing a plurality of component displays, one component display for each component color in the color displays to be formed, said numerical codes specifying the visual image densities to be formed at data display points of the component displays and further specifying the relative density of each component color in the color correspondng to the sample value associated with such display points;

b. processing the input digital data sequence to determine the sample values for the data display points;

c. assigning numerical codes from the assignment table to define image densities of the data display points according to the sample values thereof;

d. organizing the numerical codes assigned to the data display points into output sequences for each of the component displays;

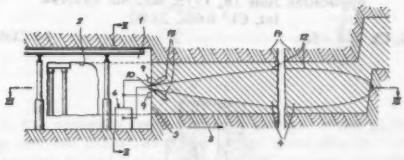
e. forming a component display for each output sequence; and

f. displaying in superimposition the component displays in their respective component colors, to thereby form the color graphic display wherein the resulting colors of the data display points are quantitatively indicative of the input digital data.

3,961,307
EXPLORATION OF THE BOUNDARIES OF AN UNDERGROUND COAL SEAM

Hans-Joachim Hochheimer, Recklinghausen; Hans Haas, Essen; Hans-Ludwig Jacob, Recklinghausen; Paul Helling, Herne, and Bernhard Wulk, Essen, all of Germany, assignors to Ruhrkohle Aktiengesellschaft, Essen, Germany

Filed Sept. 10, 1974, Ser. No. 504,768
Claims priority, application Germany, Sept. 12, 1973, 2345884
Int. Cl.² G01V *1/00, 1/22*
U.S. Cl. 340—15.5 CP **9 Claims**



1. A method of exploring the boundaries of a coal seam, comprising the steps of:

emitting modulated monochromatic sound waves from a set of juxtaposed, coherently excited transmitting transducers at a location below ground into a coal seam to be explored, said location immediately adjoining said seam;

detecting, through a set of juxtaposed receiving transducers at said location, beamed reflections of said sound waves from a discontinuity of said seam;

scanning said discontinuity by operating at least one of said sets of transducers with a progressively varying phase relationship to change the direction of a major lobe of a directive pattern of said sound waves; and

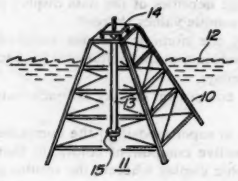
determining the distance from said location to said discontinuity from the time lapse between emission and reception of said sound waves in different scanning positions of said directive pattern.

3,961,308

OIL AND GAS WELL DISASTER VALVE CONTROL SYSTEM

William H. Parker, Hurst, Tex., assignor to Del Norte Technology, Inc., Euless, Tex.

Filed Oct. 2, 1972, Ser. No. 294,289
Int. Cl.[2] G01V 1/14; E21B 35/00
U.S. Cl. 340—18 NC 7 Claims



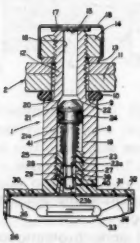
1. A system for communicating into an oil or gas well comprising a gas or oil tubing extending down into said well, transmitting sonic energy transducer means near one end of said tubing for distinctively activating said tubing walls with sonic energy to transmit signals to the walls of said tubing, said transducer comprising magnetostrictive means for supporting the weight of said tubing, wherein said magnetostrictive means comprises a plurality of nickel rods having coils thereon, means for periodically energizing said coils to change the length of the nickel rods thereby lifting and lowering said supported tubing, means near the other end of said tubing for detecting the signals transmitted through said walls, and means responsive to said detection of said signals for performing a control function near said other end of said tubing.

3,961,309

HIGH-LOW TIRE PRESSURE SIGNAL SWITCH

William C. Eddy, Columbus, Ohio, assignor to Aspro, Incorporated, West Port, Conn.

Continuation-in-part of Ser. No. 567,533, April 14, 1975. This application June 18, 1975, Ser. No. 587,994
Int. Cl.[2] B60C 23/02
U.S. Cl. 340—58 14 Claims



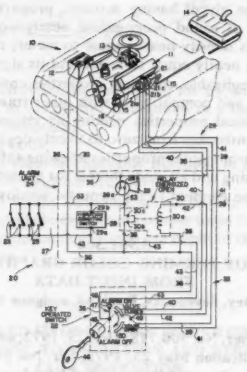
1. In a vehicle tire pressure signaling system of a type in which magnetically activated alarm circuitry is actuated by a pressure switch, the construction including pressure cylinder means having pressure and contactor ends; rod and O-ring piston means having pressure and switch contactor ends movable in said cylinder means; spring means in the cylinder means reacting between the cylinder and piston means normally biasing the piston means toward the cylinder means pressure end to maintain the piston means in an intermediate position when the pressure ends of the piston and cylinder means are exposed to predetermined desired tire pressure; the cylinder means contactor end having electrical contactors; the piston rod contactor end having contactor means adapted to engage the cylinder means contactors in switch closed position when the piston means is in intermediate position to provide a circuit through the piston rod; the piston means being movable in the cylinder means in one direction or the other from intermediate position upon change in tire pressure to above or below the said predetermined desired value to establish an open switch condition of the switch contactors and to open the circuit through the piston rod; and means connecting said switch contactors with magnetically activated signaling system circuitry.

3,961,310

VEHICLE ANTI-TAMPERING ANTI-THEFT PROTECTION SYSTEM

Daniel E. Grant, 3229 Yorkshire Road, Cleveland Heights, Ohio 44118

Continuation-in-part of Ser. No. 355,881, April 30, 1973, abandoned. This application June 28, 1974, Ser. No. 484,276
Int. Cl.[2] B60R 25/04, 24/10
U.S. Cl. 340—65 11 Claims



1. An anti-tampering anti-theft protection system for a vehicle of the type having a body, a plurality of closures on the body, and an engine supplied with fuel through a fuel supply connected to a fuel tank, comprising in combination:

a. a latching solenoid operated fuel cutoff valve interposed in the fuel supply for preventing the supply of fuel from the tank, said latching solenoid valve having at least three electrical terminals;

b. one pair of the terminals being operable, when energized, to close said valve;

c. another pair of the terminals being operable, when energized, to open said valve;

d. alarm means including a motion sensitive switch electrically connected to an audible signal device, the motion sensitive switch being operative when the alarm means is enabled to energize the signal device in response to sensed vehicle movement;

e. said alarm means further including a closure actuated switch electrically connected to said signal device and operative when said alarm means is enabled to energize said signal device in response to sensed opening of a body closure;

f. electrical switch means electrically connected through first conductor means to said one pair of terminals and to said alarm means;

g. the electrical switch means having an operator movable between alarm-on and alarm-off positions, said operator being operable upon movement from the alarm-off to the

alarm-on positions to energize said one pair of terminals and to enable said alarm means;

h. the electrical switch means being electrically connected through second conductor means to said another pair of terminals;

i. the electrical switch means being operable upon movement of the operator from the alarm-off to the alarm-on positions to energize said another pair of terminals through the second conductor means piror to energizing said one pair of terminals through the first conductor means; and,

j. the electrical switch means additionally being operable upon movement of the operator from the alarm-on to the alarm-off positions to energize said one pair of terminals through said first conductor means prior to energizing said another pair of terminals through said second conductor means.

3,961,311

CIRCUIT ARRANGEMENT FOR CORRECTING SLIP ERRORS IN RECEIVER OF CYCLIC BINARY CODES

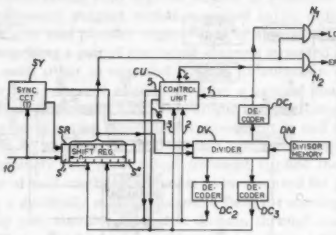
Gustavo Pavoni, Milan; Enzo Repossi, Voghera, and Mario Loiudice, Monza, all of Italy, assignors to Societa Italiana Telecomunicazioni Siemens S.p.A., Milan, Italy

Filed Dec. 27, 1974, Ser. No. 536,992

Claims priority, application Italy, Dec. 27, 1973, 32267/73

Int. Cl.² G06F 11/00; H04L 7/00

U.S. Cl. 340—146.1 D **7 Claims**



1. In a receiver for cyclic binary codes forming *n*-bit code words with *k* information bits and (*n*-*k*) redundancy bits, the bits of each code word normally constituting the coefficients of a composite polynomial which is a multiple of a predetermined generator polynomial, in combination:

a shift register having an input connected to a communication channel carrying an unbroken succession of *n*-bit code words arriving during consecutive transmission cycles, said shift register including a group of *n* intermediate stages for the temporary storage of the bits of an incoming code word to be decoded, at least one initial stage upstream of said intermediate stages for the temporary storage of the first bit of an immediately succeeding code word, and at least one terminal stage downstream of said intermediate stages for the temporary storage of the last bit of an immediately preceding code word;

a divider with a dividend input connected only to said intermediate stages, a divisor input connected to a source of said generator polynomial, and output means carrying bits of a remainder resulting from the division of said generator polynomial into the composite polynomial defined by said *n* bits;

timing means for enabling the readout to said dividend input, during a predetermined period at the end of every *n*-bit transmission cycle, of the bits stored in said *n* intermediate stages;

discriminating means connected to said output means for generating a first signal in response to said remainder being zero, a second signal in response to said remainder having values indicative of a backward slip of the stored code word by a number of bit positions not exceeding the number of said initial stages, and a third signal in response to said remainder having values indicative of a forward slip of the stored code word by a number of bit positions not exceeding the number of said terminal stages;

gate means connected to said intermediate stages and to said discriminator means for reading out the stored code word to a load in response to said first signal; and

stepping means for said shift register connected to said output means for shifting the stored bits forward in response to said second signal and backward in response to said third signal, within said predetermined period, to an extent compensating for the slip indicated by said remainder, thereby enabling the readout of a corrected version of said stored code word to the load.

3,961,312

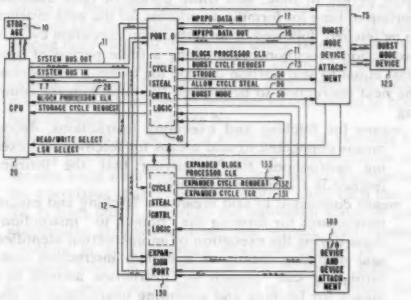
CYCLE INTERLEAVING DURING BURST MODE OPERATION

Ronald Eugene Bodner; Thomas L. Crooks; John E. Guest, all of Rochester, Minn.; Israel B. Magrisso, Coral Springs, Fla., and Keith K. Slack, Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed July 15, 1974, Ser. No. 488,349

Int. Cl.² G06F 3/00

U.S. Cl. 340—172.5 **12 Claims**



1. In a computer system including storage, central processing unit and I/O devices, said central processing unit being connected to said storage and to said I/O devices, said central processing unit including means for controlling the operation of said storage, and further including means for granting storage cycles to said I/O devices, at least one I/O device being connected to selectively operate in a dedicated mode, whereby said CPU grants successive storage cycles thereto without interruption, and at least one I/O device being connected to selectively operate in a non-dedicated mode, whereby storage cycles are granted thereto by said CPU when said I/O device operating in a dedicated mode is not operating or when said I/O device operating in a dedicated mode yields an allocated storage cycle while continuing to operate in said dedicated mode, the improvement comprising:

means for detecting when said I/O device operating in a dedicated mode is unable to use the next occurring storage cycle,

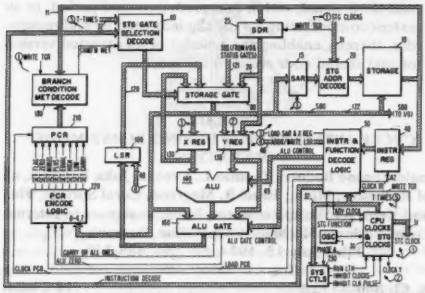
means for generating an allow signal in response to detecting when said I/O device operating in a dedicated mode is unable to use the next occurring storage cycle, and

means responsive to said allow signal for granting said next occurring storage cycle to said I/O device operating in said non-dedicated mode while said I/O device operating in said dedicated mode remains in said dedicated mode.

3,961,313
COMPUTER CONTROL APPARATUS

Ronald E. Bodner; Thomas L. Crooks, both of Rochester, Minn.; Israel B. Magrisso, Coral Springs, Fla.; Keith M. Slack, Rochester, Minn., and Richard S. Smith, Boca Raton, Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 4, 1974, Ser. No. 529,677
Int. Cl.² G06F 9/18
U.S. Cl. 340—172.5 **8 Claims**



1. Control apparatus for a stored program computer having an instruction cycle, said instruction cycle including an instruction fetch cycle, said instruction fetch cycle taking a finite period of time, said finite period of time including a portion of time for forming an address for the next instruction to be fetched, followed by an instruction execution cycle, said instruction execution cycle taking a finite period of time at least equal to said portion of time for forming an address for the next instruction to be fetched the improvement comprising

means for fetching and executing instructions, decoding means connected to said means for fetching and executing instructions for identifying that the instruction fetched is a branch instruction;

means connected to said means for fetching and executing instructions for forming the "branch to" instruction address during the execution of an instruction identified by said decoding means as a branch instruction and for furnishing said "branch to" instruction address to said means for fetching and executing instructions to enable the same to fetch said "branch to" instruction, and

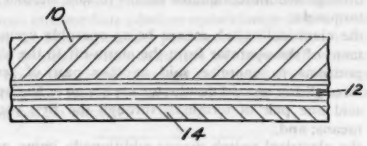
means responsive to said decoding means identifying the instruction fetched as a branch instruction for generating a control signal for skipping said portion of time for forming an address for the next instruction to be fetched during said instruction fetch cycle for said "branch to" instruction and furnishing said control signal to said means for fetching and executing instructions.

3,961,314
STRUCTURE AND METHOD FOR PRODUCING AN IMAGE

Peter H. Klose, Troy, and Stanford R. Ovshinsky, Bloomfield Hills, both of Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Filed Mar. 5, 1974, Ser. No. 448,289
Int. Cl.² G11C 11/42; H01L 17/00
U.S. Cl. 340—173 LS **79 Claims**

1. A structure comprising a layer comprising an imaging material which is capable of an image forming change upon the application of energy and wherein the image forming change can be promoted by a catalyst material, a barrier layer, comprising a barrier material, in contact on one side with said layer of imaging material, and in contact with said barrier layer on the opposite side thereof a layer comprising a catalyst material, which is capable of traversing the barrier layer and of promoting, in activated form, the image forming change in said layer of imaging material, wherein the layer of barrier

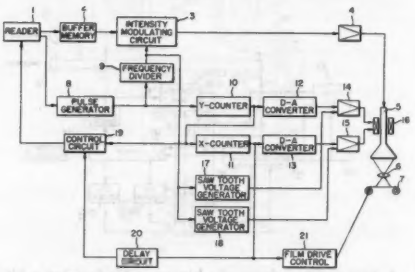


material has the capacity of controlling transmission of the catalyst material from the layer of catalyst material to the layer of imaging material in response to energy.

3,961,315
INFORMATION RECORDING SYSTEM

Noboru Yokoyama, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 397,805, Sept. 17, 1973. This application Apr. 11, 1975, Ser. No. 567,054
Int. Cl.² G11C 13/04
U.S. Cl. 340—173 LM **18 Claims**



3. An information recording system for recording digital information upon a micro-film comprising:

a. a digital information source for generating digital information;

b. a micro-film having a base of a first density;

c. optical beam generating means for recording the information from said digital information source upon said micro-film;

d. control means for controlling the brightness and the location of said optical beam from said optical beam generating means to record said digital information intermittently in the recording direction as dark and light images, which are different from said first density;

said control means further including,

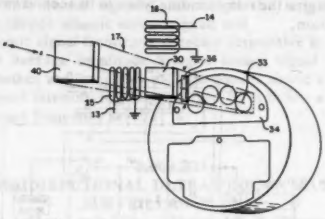
i. intensity modulating means, connected to said optical beam generating means, for modulating said optical beam to first, second and third brightnesses different from each other, wherein the second brightness and the third brightness correspond to the digital information from said digital information source, and

ii. deflecting means, operable in synchronism with said modulating means, for locating said optical beams along the recording direction so that said second or third brightness beams are alternately repeated with respect to said first brightness optical beam.

3,961,316
MECHANICALLY ACTUATED MAGNETOCRYSTALLINE COUNTER

Jon H. Myer, Woodland Hills, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Dec. 23, 1974, Ser. No. 535,868
Int. Cl.² G11C *11/14*
U.S. Cl. 340—174 TF **11 Claims**



1. A mechanically actuated magnetocrystalline counter for counting a series of mechanical events, said counter comprising:

a. a uniaxially anisotropic magnetocrystalline platelet having means associated therewith for sustaining at least one movable cylindrical magnetic domain therein and means for guiding said domain to move sequentially through a predetermined shift register pattern of positions therein;

b. permanent magnet means mounted to be moved relatively to said platelet responsively to a mechanical event comprising a pair of apertured magnets mounted adjacent to each other in opposed polarity relationship with the apertures thereof aligned to form a central chamber in which said uniaxially anisotropic magnetocrystalline platelet is spring mounted for movement in and orthogonally to the central field of said apertured magnets responsively to a mechanical transient applied thereto by one of said mechanical events to be counted for generating a cyclically moving magnetic field for moving said at least one movable magnetic domain through said serial shift register formed in said platelet to form a bit stream which digitally accumulates data representative of said series of mechanical events, each cycle of said field motion resulting from one of said mechanical events and each said cycle of said field motion producing a single bit in said bit stream; and,

c. means to read out the count thereby accumulated in said shift register.

3,961,317
SYSTEM FOR REMOTE READING OF INDICATING DEVICES AS METERS AND THE LIKE

Francois Regis Marcetteau De Brem, Paris, and Maurice Denis Waroux, Deuil-la-Barre, both of France, assignors to Gaz de France, Paris, France

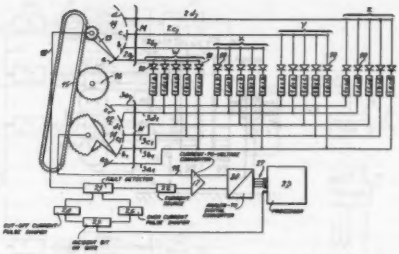
Filed May 3, 1973, Ser. No. 357,067
Claims priority, application France, May 8, 1972, 72.16391
Int. Cl.² G08C *15/06*
U.S. Cl. 340—188 R **13 Claims**

1. An electrical apparatus for detecting, transmitting and storing in a remote central recording device under digital form the total number of events which have occurred from a known origin of time in each of a large set of indicating devices and for converting said digits in such a way that said number of events may be processed comprising:

individual means controlled by the relevant indicating device causing the change of state of an alternating electrical switch associated with an electrical impedance upon the occurrence of any relevant event such as the fact that a predeterminate amount of a physical magnitude has passed through a given indicating device;

means for electrically grouping several such alternating electrical switches associated each with an electrical impedance whereby the switches and the impedances are electrically connected together and with an additional failure detecting impedance not associated with any switch in such a manner that the impedances may be combined and wherein any individual switched impedance and said failure detecting impedance and any combination thereof is different from any other resultant impedance and combination thereof;

means for electrically connecting each of a plurality of such electrical groups of several alternating electrical switches associated each with an electrical impedance and said failure detecting impedance to one of M lines of a first lattice on the one hand and to one of N lines of a second



lattice on the other hand, whereby any one among the M lines of the first lattice may be connected to any one among the N lines of the second lattice through only one of said electrical groups of several alternating electrical switches and said failure detecting impedance, the maximum number of groups of switches so connected to both lattices being thus M times N;

means for cyclically scanning every group of switches by serially electrically energizing during short durations on the one hand each line of the M lines lattice and, during the energizing of said line, on the other hand each line of the N lines lattice, whereby the individual states of said electrically grouped switches are sensed, said sensing resulting in an elementary electrical current of short duration which is an image of said individual states of switches, and wherein the interval of time between two consecutive scannings of any group of switches is shorter than the minimum normal time interval covering two consecutive changes of state of any switch of said group;

analog-to-digital converter means receiving successively the elementary electrical currents of short durations which are each the image of the individual states of a group of switches and serially transmitting said elementary electrical currents and translating said image into an elementary logical binary electrical current the highs and lows of which represent the on and off states of the relevant individual switches;

a first memory means where said on and off states of the individual switches are stored;

means comparing the last sensed state of each individual switch with the state of the same switch sensed on the immediately preceding scanning as it is stored in a second memory means, whereby if the state of a switch is unchanged the record of the indication of the dial corresponding to the indicating device controlling said switch is unchanged, whereas if the state of a switch is altered with reference to the state of the same switch on the previous scanning the corresponding record of the indication of the dial is altered in a manner corresponding to the manner it would be altered if it were directly controlled by the relevant indicating device; and

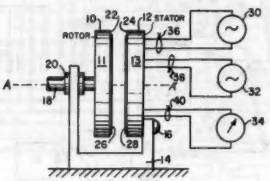
means to transfer the recording of the last scanning as it is in the first memory means to the second memory means

in place of the recording of the preceding scanning in order that a new comparison of the consecutive states of each switch at two successive scannings may be performed after the next scanning of the switches.

3,961,318
ELECTROSTATIC POSITION-MEASURING TRANSDUCER

Robert W. Farrand, Weston, Conn., and Joseph Elbling, Armonk, N.Y., assignors to Inductosyn Corporation, Valhalla, N.Y.

Filed Jan. 17, 1975, Ser. No. 541,983
Int. Cl.² G08C *19/16*
U.S. Cl. 340—200 **17 Claims**



1. A transducer having a plurality of measurement cycles comprising:

a. two relatively movable elements, each said element having a surface positiond in spaced opposition to a surface of the other element;

b. two sets of first electrodes fixed on the surface of one of said elements, each first electrode having a base portion and a finger portion extending from said base portion in a direction transverse to the path of relative movement of said elements, the finger portions of each set of first electrodes being uniformly spaced one measurement cycle apart, and the finger portions of one set of first electrodes being interdigitated at one-half cycle spacing with the finger portions of the other set of first electrodes;

c. two sets of second electrodes fixed on the surface of the other said elements, each set of second electrodes having finger portions extending in a direction transverse to said path and spaced approximately one cycle apart opposing the finger portions of said sets of first electrodes, the finger portions of one set of second electrodes being uniformly interdigitated with the finger portions of the other set of second electrodes;

d. first and second coupling electrodes fixed on the surface of said other of said elements, said coupling electrodes respectively opposing and capacitively coupling with the base portions of said two sets of first electrodes;

e. means for electrically interconnecting each set of second electrodes, respectively, and for connecting said sets of second electrodes in an external circuit; and

f. means for connecting said first and second coupling electrodes in an external circuit.

3,961,319
GROUND CIRCUIT MONITOR

James Robert Asberry, Mount Carmel, Ill., assignor to AMF Incorporated, White Plains, N.Y.

Filed May 21, 1975, Ser. No. 579,385
Int. Cl.² G08B *21/00*
U.S. Cl. 340—255 **18 Claims**

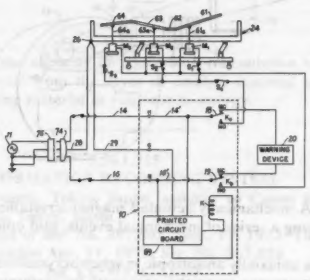
1. In a ground monitor device the combination comprising

first, second and third input terminals for coupling thereto, respectively, the high, ground and neutral conductors of an electrical supply source, said ground and neutral conductors normally being coupled to earth ground at least at said source,

a relay winding connected between said high and neutral conductors,

switching means having first and second switching conditions connected between said high and neutral conductors,

said switching means operating to energize said relay winding when in its first switching condition and operating to deenergize the relay winding when in its second switching condition,



means responsive to the voltage between said second and third input terminals for producing a first signal when said voltage differs by a predetermined magnitude from a given voltage,

means coupling said switching means to the means responsive to the voltage between the second and third input terminals for operating the switching means to its second switching condition upon occurrence of said first signal,

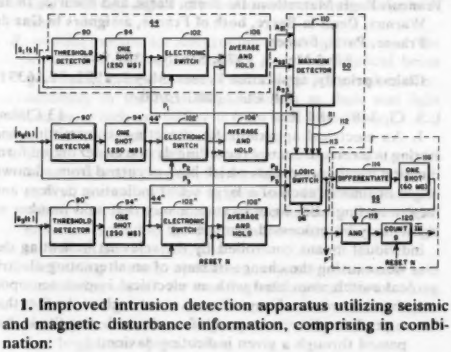
delayed operating latch means operatively coupled to said switching means for latching said switching means in its second switching condition at a fixed time delay after occurrence of said first signal, and

relay switch means operable in response to energization of said relay winding.

3,961,320
INTRUSION DETECTION SYSTEMS

David P. Erdmann, Hopkins, and Dennis L. Kurschner, Minnetonka, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Division of Ser. No. 368,162, June 8, 1973, Pat. No. 3,846,790.
This application Sept. 3, 1974, Ser. No. 503,003
The portion of the term of this patent subsequent to Nov. 5, 1991, has been disclaimed.
Int. Cl.² G08B *13/00*
U.S. Cl. 340—258 D **5 Claims**



1. Improved intrusion detection apparatus utilizing seismic and magnetic disturbance information, comprising in combination:

seismic sensor means responsive to seismic disturbances in each of a plurality of locations along a predetermined boundary to produce a plurality of seismic sensor signals each of which is indicative of the disturbance in a distinct location;

magnetic sensor means producing a signal indicative of the magnetic disturbances in one location along a predetermined boundary;

seismic maximum means which receives said plurality of seismic sensor signals, and selects the largest average amplitude seismic sensor signal; and

a seismic signal frequency detector responsive to said largest average amplitude seismic sensor signal to detect whether the frequency of disturbances above a predetermined intensity represented thereby is below a predetermined frequency level.

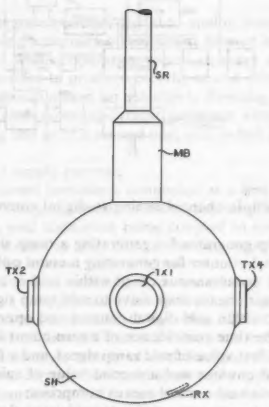
3,961,321
OMNIDIRECTIONAL ULTRASONIC INTRUSION SURVEILLANCE UNIT

Royston Arthur Leslie Moss, "Fishpools", Werrington., Peterborough, England

Continuation-in-part of Ser. No. 397,853, Sept. 17, 1973, abandoned. This application Jan. 24, 1975, Ser. No. 543,821

Int. Cl.[2] G08B *13/16*

U.S. Cl. 340—258 B **7 Claims**



1. An omnidirectional ultrasonic surveillance unit for used in a closed environment and comprising:

a substantially closed shell forming a housing;

means for supporting the housing away from any ceiling, walls and floor of the closed environment so that there is open space substantially all around the housing;

means for radiating oscillatory energy at an ultrasonic frequency in substantially all directions from said surveillance unit so that the open space all around the housing is filled with sound waves;

said housing being adapted to vibrate in response to reflected sound waves impinging thereon;

receiver transducer means connected to the inside of said housing for sensing vibration thereof and for generating an oscillatory electrical signal in response thereto; and

electrical circuitry inside the housing, said electrical circuitry including:

means for generating said oscillatory energy inside the housing and for driving said radiating means;

means for amplifying the oscillatory electrical signal generated by said receiver transducer means;

discriminator means for producing a variable DC signal responsive to amplitude variations in the amplified oscillatory electrical signal from the amplifying means;

low frequency amplifier means for amplifying low frequency signals from said discriminator means; and

means responsive to the output from said low frequency amplifier means for producing an electrical alarm-operating signal.

3,961,322
REAL TIME SIGNAL DISCRIMINATION CIRCUITRY

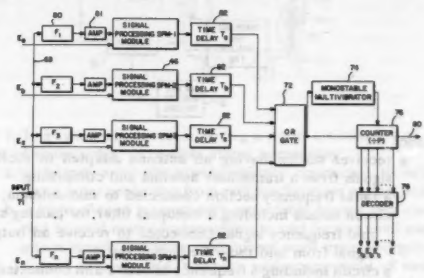
George Jay Lichtblau, 425 E. 63rd St. Suite E-12-D, New York, N.Y. 10021

Filed July 2, 1974, Ser. No. 485,206

The portion of the term of this patent subsequent to Jan. 28, 1992, has been disclaimed.

Int. Cl.[2] G08B *13/00, 21/00*

U.S. Cl. 340—280 **8 Claims**



1. For use in an electronic security system which includes means for providing in a surveillance zone an electromagnetic field of a frequency which is swept within a predetermined range, and means for detecting the presence of a resonant tag circuit having a frequency within said range, circuitry for discriminating between signals indicating the presence of a valid tag circuit in said surveillance zone and spurious signals, said circuitry comprising:

means for receiving expected signals having a plurality of pulse components of predetermined parameters occurring in a predetermined sequence and time relationship and representative of detection of said tag circuit within said surveillance zone;

at least one controllable pulse threshold detector indicating detection of a pulse component having predetermined amplitude and width parameters;

means for serially enabling said at least one controllable pulse threshold detector in a predetermined sequence and time relationship;

means for defining a predetermined time interval for detection of a real signal in response to the detection of a first pulse component thereof;

means operative in response to detection of all of the pulse components comprising the expected signal in predetermined time sequence and within the predetermined time interval to provide an alarm indication; and

means for resetting said circuitry at the end of said predetermined time interval.

3,961,323
CARGO MONITOR APPARATUS AND METHOD

Albert W. Hartkorn, Hershey, Pa., assignor to American Multi-Lert Corporation, Hershey, Pa.

Continuation-in-part of Ser. No. 117,410, Feb. 22, 1971, abandoned. This application Dec. 18, 1972, Ser. No. 315,852

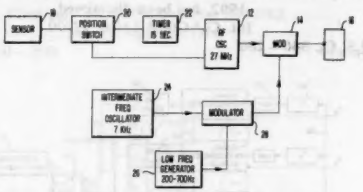
Int. Cl.[3] G08B *13/02*

U.S. Cl. 340—280 **20 Claims**

1. Cargo container monitoring system comprising:

a plurality of transmitter units each adapted for separate attachment to different cargo containers and each comprising:

a radio frequency oscillator and antenna;
means for generating a mid-frequency signal and for modulating the signal from said radio frequency oscillator;
circuit means operating at a low frequency up to about 1000 Hz connected to continuously interrupt said mid-frequency signal and including a device for controlling frequency of said interruptions with sufficient precision to enable a transmitter unit to be distinguished from other transmitter units in the system; and
a sensing element connected to cause initiation of a transmitter signal;



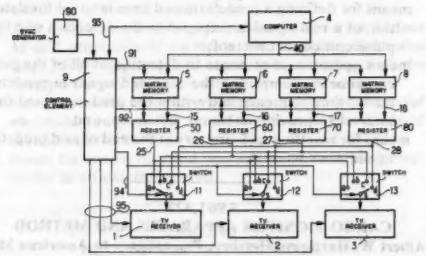
and

a receiver station having an antenna adapted to receive signals from a transmitter antenna and comprising:
a radio frequency section connected to said antenna;
circuit means including a bandpass filter for passing said mid-frequency signal connected to receive an output signal from said radio frequency station;
a circuit including a frequency selective unit connected to receive an output signal from said bandpass filter responsive only to the interruption rate at said low frequency of said mid-frequency signal for selectively producing a signal; and
an alarm circuit connected to be actuated in response to the signal from said frequency selective unit.

3,961,324
MULTIPLE RECEIVER SCREEN TYPE PICTURE DISPLAYING DEVICE

Alain Cousin, La Garenne-Colombes, and Henri Berard, Etampes, both of France, assignors to Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

Filed Mar. 5, 1975, Ser. No. 555,614
Claims priority, application France, Mar. 13, 1974, 74.08535
Int. Cl.² G06F 3/14
U.S. Cl. 340—324 AD **2 Claims**

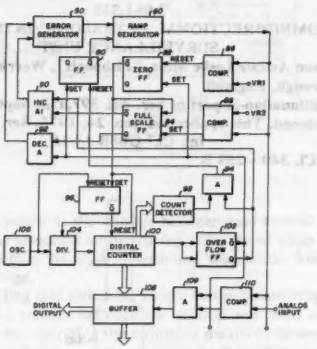


1. Device for displaying pictures on the screens of *n* receivers of the television type from binary data coming from a computer and stored temporarily in memories during the displaying of those pictures for the maintaining of the pictures on the screens, wherein said memories are $n + 1$ in number and are each connected to the said computer for their charging, said device comprising n switches ensuring the connection of any one of the $n + 1$ memories on one of the said receivers and a dynamic memory monitoring element ensuring the setting in the charge state of one of the memories during reading and the connecting of the *n* other memories respectively to the n receivers for the displaying of *n* different memories.

3,961,325
MULTIPLE CHANNEL ANALOG-TO-DIGITAL CONVERTER WITH AUTOMATIC CALIBRATION

Larry J. Kendall, Concord, and Larry D. Snyder, San Jose, both of Calif., assignors to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Filed July 15, 1974, Ser. No. 488,339
Int. Cl.² H03K 13/20
U.S. Cl. 340—347 CC **5 Claims**



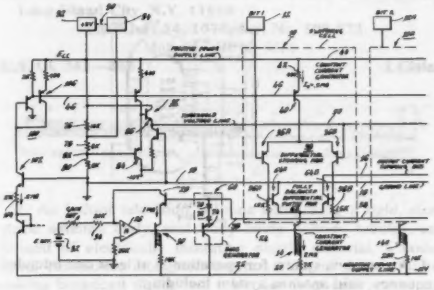
1. A multiple channel analog-to-digital converter comprising:
a. a ramp generator for generating a ramp signal;
b. a digital counter for generating a count output indicative of the instantaneous count within said counter;
c. a control means responsive to said ramp signal and to the count within said digital counter and operative to maintain the time coincidence of a zero count in said counter and a first value of said ramp signal, and a full scale count in said counter and a second value of said ramp signal, wherein said control means comprises;
i. a first means responsive to said ramp signal and operative to generate an analog full scale signal whenever said ramp signal equals said second value,
ii. a second means responsive to the count in said counter and operative to generate a digital full scale signal whenever said counter reaches said full scale count, and
iii. a third means responsive to said analog full scale signal and said digital full scale signal and operative to vary the slope of said ramp signal in accordance with the difference between the time occurrence of said analog full scale signal and said digital full scale signal,
iv. a fourth means responsive to said ramp signal and operative to reset said counter to a zero count upon the occurrence of said first value;
d. means comprising at least one channel, each channel comprising;
i. a compare means responsive to an analog input signal and operative to generate a compare signal whenever said analog input is equal to said ramp output; and
ii. a buffer means responsive to said compare signal and operative to transfer the count of said counter to said buffer for effectively producing in said buffers the digital value associated with the analog value of the analog input signal to said compare means.

3,961,326

SOLID STATE DIGITAL TO ANALOG CONVERTER

Robert B. Craven, Wayland, Mass., assignor to Analog Devices, Inc., Norwood, Mass.

Filed Sept. 12, 1974, Ser. No. 505,477
Int. Cl.[2] H03K *13/04*, *17/56*
U.S. Cl. 340—347 DA 14 Claims



1. In an integrated-circuit, digital-to-analog converter of the type comprising a plurality of transistors formed in an IC chip and arranged with cooperating means to serve as constant-current generators to produce binarily-scaled currents;

improved switch means for selectively directing the current of each such constant-current generator either to a first summing line or to a second line; said switch means comprising:

a source of supply current;

first and second transistors connected as a first differential pair providing controllable alternative conduction therethrough, said transistors being coupled to said source of supply current so that the conducting transistor of the pair carrier current from said source;

logic signal means connected to one of said first pair of transistors to apply thereto a binary logic signal;

threshold means connected to the other of said first pair of transistors to provide that the binary state of said logic signal determines which of said first pair of transistors carries the current from said source of supply current;

third and fourth matched transistors connected as a second differential pair providing selective alternative conduction thereof;

said second pair of transistors having their emitters connected together to said constant-current generator, and having their collectors connected to said first and second lines, respectively, to direct the current passing through said constant-current generator to one or the other of said lines depending upon which of said second pair of transistors has been made conductive;

first input signal means responsive to current flow through said first transistor to apply to the base of said third transistor a first control voltage turning on said third transistor when said first transistor conducts current;

second input signal means responsive to current flow through said second transistor to apply to the base of said fourth transistor a second control voltage turning on said fourth transistor when said second transistor conducts current;

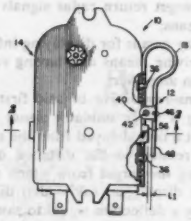
said first and second input signal means including means arranged to provide that said connected emitters of said third and fourth transistors are maintained substantially at the same voltage as the current from said constant-current generator switches from one to the other of said second pair of transistors in accordance with the state of said binary logic signal.

3,961,327

AUDIBLE ALARM FOR A SYNCHRONOUS MOTOR

Ernest F. Kloenne, and Kanti D. Patel, both of Indianapolis, Ind., assignors to P. R. Mallory & Co., Inc., Indianapolis, Ind.

Filed July 22, 1974, Ser. No. 490,805
Int. Cl.[2] G01K *1/08*; H01F *7/08*
U.S. Cl. 340—402 8 Claims



1. In a synchronous motor having a rotor, a winding, and a set of stator poles, an audible alarm, comprising:

a. a buzzer anvil electromagnetically connected to said stator poles projecting from said synchronous motor; and

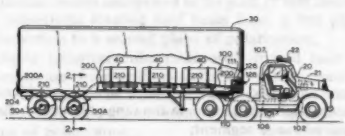
b. a bight-shaped magnetically-attractable buzzer arm carried by said motor juxtaposition to said buzzer anvil and intermittently engaging said buzzer anvil upon energization of said winding, whereby said engagement of said buzzer arm and said buzzer anvil produces a buzzing sound.

3,961,328

DETECTION SYSTEM

Lloyd H. Hornbostel, Jr., Beloit, Wis., assignor to Center for Management Services and Applied Research, Beloit, Wis.

Division of Ser. No. 368,609, June 11, 1973, abandoned. This application Aug. 5, 1974, Ser. No. 494,987
Int. Cl.[2] G08B *17/04*
U.S. Cl. 340—420 3 Claims



1. A break union for use in an ambient condition sensing system having a continuous fluid line comprising an elongated element for inclusion in fluid communication with said line, said element including a bore defining a fluid passage through said union and further defining a wall portion having a selected wall thickness, said element being constructed of a material capable of rupture in said wall portion when exposed to a given ambient condition, and the time required for the rupture of the wall portion, in response to said given ambient condition, being proportional to the selected thickness of said wall portion, whereby the break union response time can be varied by varying the thickness of said element.

3,961,329

HIGH RESOLUTION SECTOR SCAN RADAR

Herbert H. Naidich, Trumbull, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Apr. 14, 1975, Ser. No. 568,068
Int. Cl.[2] G01S *7/12*; H01J *29/70*
U.S. Cl. 343—11 R 4 Claims

1. A radar system comprising:

first oscillator means for generating a high frequency sinusoidal signal;

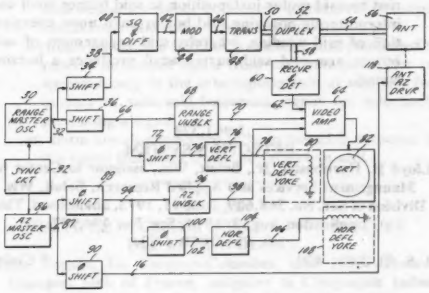
a transmitter responsive to said first oscillator means for providing radar signals at a pulse repetition frequency determined by said first oscillator means;

an antenna means responsive to said transmitter for transmitting radar signals and receiving target return radar signals;

receiving means responsive to said antenna means for processing target return radar signals received by said antenna means;

video display means for displaying information received by said receiving means and having vertical and horizontal deflection amplifier;

range means responsive to said first oscillator means for providing a range unblank signal to said video display means, at a time delayed from the radar main bang by an amount related to the distance of the range segment containing the target from which return signals are desired for display on said video display means, and for providing a deflection signal to said video display means consisting of a sine wave having a suitable amplitude, in excess of the amplitude required for maximum deflection in the range dimension, and delayed from said unblank signal by a suitable amount such that a substantially linear portion of said sinusoidal range deflection signal, coinci-



dent with said range unblank signal, provides desired video display deflection in the range dimension during the desired range segment;

second means for generating a low frequency sinusoidal signal of a frequency orders of magnitude lower than that of the signal produced by said high frequency sinusoidal means; and

azimuth means responsive to said second means for providing an azimuth unblank signal to said video display means at a time delayed from said antenna azimuth drive signal by an amount related to the difference between the total azimuth angle of antenna scan, and the azimuth angular component thereof containing the target from which return signals are desired for display on said video display means, and for providing a deflection signal to said video display means consisting of a sine wave having a suitable amplitude, in excess of the amplitude required for maximum deflection in the azimuth dimension, and delayed from said azimuth unblank signal by a suitable amount such that a substantially linear portion of said sinusoidal azimuth deflection signal, coincident with said azimuth unblank signal, provides desired video display deflection in the azimuth dimension during the desired azimuth increment, and for providing synchronization of the antenna azimuth scan with the video display deflection in the azimuth dimension.

3,961,330

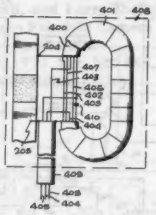
ANTENNA SYSTEM UTILIZING CURRENTS IN CONDUCTIVE BODY

Ross Alan Davis, 724 Ala Moana Blvd., Honolulu, Hawaii 96813

Continuation of Ser. No. 427,258, Dec. 21, 1973, abandoned. This application Feb. 24, 1975, Ser. No. 552,569

Int. Cl.² H01Q 1/32

U.S. Cl. 343—712 **4 Claims**



1. An antenna system for operation at at least one intended frequency, said antenna system including:

an electrically conductive three-dimensional body forming a closed loop for the flow of radio frequency signals therethrough at said at least one intended frequency when said body is exposed to a radio frequency field, said loop having a length which is short with respect to a resonant fraction of a wavelength at said intended frequency;

a column of relatively reduced cross-sectional area connecting major surfaces of said body and through which said radio frequency signals tend to flow;

means cooperating with said column portion for increasing the electrical impedance of a segment of said column portion; and,

body resonating means connected directly to said column portion across said segment for producing forced electrical resonance of said body at said intended frequency.

3,961,331

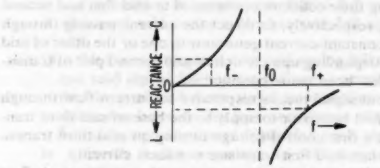
LOSSY CABLE CHOKE BROADBAND ISOLATION MEANS FOR INDEPENDENT ANTENNAS

Donn V. Campbell, Eatontown, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 21, 1975, Ser. No. 579,645

Int. Cl.² H01Q 1/52

U.S. Cl. 343—792 **11 Claims**



1. In a broadband antenna system including at least two dipole antennas respectively coupled to first and second radio apparatus, said antennas being mounted one above the other and having a predetermined spacing therebetween with respective pairs of antenna elements being aligned generally along a common vertical axis and having a first feedline coupling said first radio apparatus to the upper dipole antenna and a second feedline coupling said second radio apparatus to the lower dipole antenna, the improvement comprising:

the first feedline being configured to include an isolator section in said predetermined spacing between said at

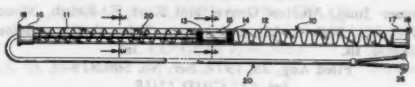
least two dipole antennas, said isolator section being comprised of a plurality of series connected cable choke sections, each having a respective electrical damping resistor shunted thereacross.

3,961,332

ELONGATED TELEVISION RECEIVING ANTENNA FOR INDOOR USE

Marvin P. Middlemark, 96 Store Hill Road, Old Westbury, Long Island City, N.Y. 11568

Filed July 24, 1975, Ser. No. 598,573
Int. Cl.² H01Q 9/16
U.S. Cl. 343—802 2 Claims



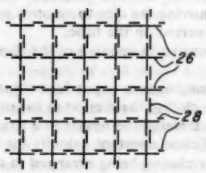
1. An indoor television antenna comprising a rigid, elongated antenna body, said body being hollow, tubular, and formed of electrically insulating plastic material, a coiled spiral conductive elongated antenna element device for receiving broadcast directional television frequency waves and disposed within and substantially throughout the length of said body to define a dipole, and an elongated flexible transmission line having at least two conductors, one end of said line with its said conductors entering one end of said body and its said conductors at said one end of said line being connected to said dipole antenna at a central portion, and the conductors at the other end of said line being adapted for connection to the input system of a television receiver, the length of said transmission line between said one end of said body, and said other end of said line being greater than the length of said body, said body being free of supporting structure other than its own rigid tubular form and its said transmission line whereby said body may be freely physically oriented in any position of reception limited only by its end connection to said line.

3,961,333

RADOME WIRE GRID HAVING LOW PASS FREQUENCY CHARACTERISTICS

Donald L. Purinton, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 29, 1974, Ser. No. 501,518
Int. Cl.² H01Q 1/42
U.S. Cl. 343—872 5 Claims



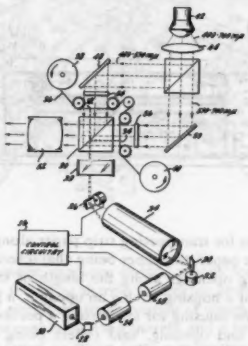
1. A radome comprising:
a sheet of dielectric material forming a window,
a plurality of discontinuous electrical conductors forming a linear grid embedded within said sheet, and
distributed capacitor means for coupling said plurality of conductors together across points of discontinuity to provide capacitance and inductance at a preselected radar frequency,
whereby said radome passes radio frequency energy at said radar frequency with substantially no attenuation and also passes radio frequency energy at frequencies less than about one half said preselected radar frequency.

3,961,334

COMBINED LASER RECORDING AND COLOR PROJECTION SYSTEM

Clyde M. Whitby, Valencia, and Douglas L. White, Granada Hills, both of Calif., assignors to The Singer Company, New York, N.Y.

Filed Aug. 11, 1975, Ser. No. 603,414
Int. Cl.² G01D 9/32
U.S. Cl. 346—17 5 Claims



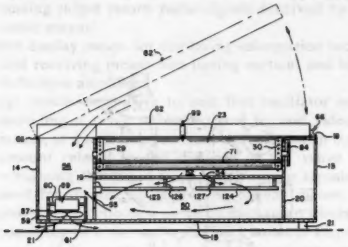
1. A recording and projection system including: a laser; means for selectively deflecting the beam of said laser and focusing said beam upon a recording medium having a normal first transparency state that is changed into a second transparency state where exposed to said focused laser beam; and means including backlighting means and a projection lens system for projecting the images in said recording medium to a display screen; the improvement comprising:
polarization means interposed in the path of said laser beam for selectively rotating said beam from a first plane of polarization to a second plane of polarization;
a dichroic polarizer cube interposed in said laser beam downstream from said polarization means, said cube reflecting said beam when polarized in said first plane and transmitting said beam when polarized in said second plane of polarization;
first and second recording mediums positioned at the focal points of said transmitted beam and said reflected beam;
a source of white projection light;
a dichroic element interposed in the beam produced by said source, said element having dichroic properties substantially identical with the dichroic properties of said dichroic polarizer cube, said element producing from said white light a band of long wavelength visible light that is transmitted through said element to backlight said first recording medium, and a band of short wavelength visible light that is reflected by said element to backlight said second recording medium;
whereby images recorded in said first recording medium are transmitted through said dichroic polarizer cube to be projected in visible light in the long wavelength band, images recorded in said second medium are reflected by said dichroic polarizer cube to be projected in visible light in the short wavelength band, and light from both long wavelength and short wavelength bands backlighting identical images recorded in both of said first and second mediums will be combined to project images in a color containing both said long wavelength and said short wavelength bands.

3,961,335

GRAPHIC RECORDER WITH PAPER POSITIONING AND TENSIONING MEANS

James F. Gordon, Saratoga, Calif., assignor to Zeta Research Inc., Lafayette, Calif.

Filed Dec. 16, 1974, Ser. No. 532,897
Int. Cl.² G01D 15/30; B65H 17/28
U.S. Cl. 346—136 14 Claims



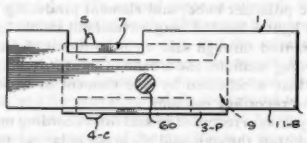
1. Apparatus for transporting strip paper along a path from a supply of the paper, the paper being characterized in having means forming openings along the length of the paper, the combination of a housing having an opening, a pair of rollers mounted on the housing for supporting a portion of the strip paper across said opening, said rollers being mounted for rotation about respective transversely extending axes which are spaced-apart along said path, sprocket means on each of said rollers, said sprocket means including a plurality of radially extending pins positioned in register with the openings for releasably engaging the same, drive means for conjointly rotating said rollers and sprocket means for moving the strip paper along the path, and means creating a differential air pressure on opposite sides of the portion of strip paper which is suspended between the rollers, said differential air pressure serving to produce a resultant force acting in a direction against said suspended portion of the strip chart so that the outer side edges of the openings are urged into engagement with the outer sides of respective pins whereby the suspended portion of the strip paper maintains registry with the rollers irrespective of wear or irregularities in the openings or in dimensional changes of the paper.

3,961,336

ELECTRODE PRINT HEAD

John A. Walker; Dimitri S. Dimitri, both of Northridge, and Reginald Louis Perkins, Los Angeles, all of Calif., assignors to Datametrics Corporation, Van Nuys, Calif.

Filed May 21, 1975, Ser. No. 579,460
Int. Cl.² G01D 15/08
U.S. Cl. 346—139 C 14 Claims



1. An improved print-head assembly comprising a plurality of print-electrode sets separated by separator sheets, each electrode set being comprised of a thin electrode foil having at least one resilient contact arm member cantilevered out from the electrode body so as to accommodate resilient reciprocation toward and away therefrom, plus a pair of thin dielectric sheets each being disposed on one side of said electrode to isolate it electrically and being relieved adjacent each said arm thereof to accommodate the unimpeded reciprocation of the arm;

each foil electrode being fashioned by selecting a prescribed metal sheet and generating a prescribed print-electrode structure therefrom without introducing any appreciable lateral protrusions on said electrode;

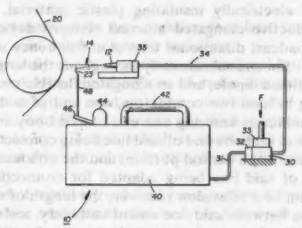
said array of print-electrodes and associated separation means being mounted in an aligned array and retained so aligned as an integral assembly in a prescribed holder means.

3,961,337

DISPOSABLE INK SUPPLY AND NOZZLE SYSTEM USING A SIMPLE PUMP

Werner Jung, Morton Grove, and Kurt E. Knuth, Mount Prospect, both of Ill., assignors to Teletype Corporation, Skokie, Ill.

Filed Aug. 26, 1974, Ser. No. 500,819
Int. Cl.² G01D 15/18
U.S. Cl. 346—140 R 1 Claim



1. In combination with an inkjet printer of the type having a nozzle from which ink is forced in a stream of drops, which are manipulated electrostatically to print information patterns on a sheet of paper placed in the printer, and wherein relative movement is caused between the nozzle and the paper to print a page of copy, after which the page is removed and a fresh sheet of paper is inserted in the printer, an improved apparatus for forming a constant pressure ink jet of sufficient duration to print a full page, which comprises:

a thin-walled cylindrical tube with closed ends, the tube being made of a compressible resilient plastic;

an ink supply line connecting the tube to the nozzle;

a pair of dies between which the tube is mounted with the dies engaging opposed portions of the cylindrical wall of the tube;

means for moving the dies to an open position, in which no force is exerted on the tube;

means responsive to opening of the dies for filling the tube with ink;

means responsive to a paper-feed signal to the printer for gradually closing the dies so as to compress the tube and force ink through the nozzle in a stream of droplets having a sufficient constant velocity for ink jet printing, the means for closing being arranged to close the dies with a gradually increasing force required to squirt the ink through the nozzle at a substantially constant pressure for a time long enough to print one page of copy after start up, the means for closing the dies being timed to start the ink stream prior to the time that a fresh page has been inserted and printing is to begin so that the effect of an initial shock wave when the dies start to close is dissipated prior to printing and a steady-state, constant-velocity ink jet is established prior to the start of printing each new page;

means responsive to the completion of each page of printing for operating the means for opening the dies, the walls of the plastic tube springing back to their cylindrical configuration when the dies are opened and creating a partial

vacuum in the tube, which vacuum is effective to suck ink into the tube from the means for filling;

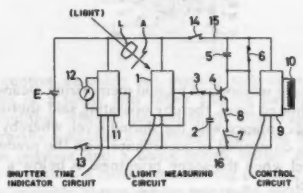
a refill line connecting the tube with the means for filling; and

a one-way check valve in the refill line for allowing ink to pass only from the supply means to the tube, and preventing any flow through the refill line when the dies are closed.

3,961,338
AUTOMATIC EXPOSURE TIME CONTROL DEVICE FOR USE IN SINGLE LENS REFLEX CAMERA

Masayoshi Sahara, Toyokawa, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Apr. 22, 1975, Ser. No. 570,320
Claims priority, application Japan, Apr. 24, 1974, 49-46801
Int. Cl.² G03B 7/08, 9/62
U.S. Cl. 354—24 **5 Claims**



1. An automatic exposure time control device for use in a single lens reflex camera including anobjective lens, a shutter and a diaphragm, said exposure control device comprising:

a light measuring circuit for generating an output voltage proportional to the logarithm of the intensity of light which has come from an object to be photographed and passed through said objective lens and said diaphragm;

means for storing said output voltage;

means connected to one terminal of said storing means for converting said output voltage stored in said storing means to a current proportional to the antilogarithm thereof;

means for integrating said current;

means for commencing the integration of said integrating means simultaneously with commencement of the opening of said shutter due to shutter release operation;

means for controlling the closure of said shutter depending on the voltage across said integrating means;

a power source for providing electric power to said light-measuring circuit, converting means and controlling means;

first and second conductive means respectively connected to the opposite terminals of said power source, said light measuring circuit, converting means and said control means being connected between said first and second conductive means in parallel with each other, said integrating means being connected between said converting means and second conductive means, and another terminal of said storing means being connected to said first conductive means;

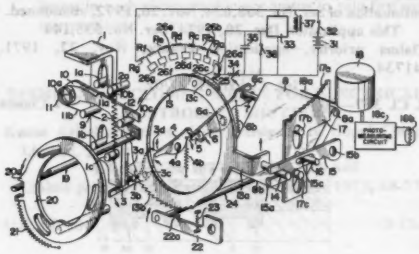
a first switch openable in response to shutter cocking operation and closable in response to the shutter release operation prior to commencement of the opening of said shutter; and

a second switch closable at the latest with the commencement of opening of said shutter and at the earliest with the cocking of said shutter and openable at the earliest with the commencement of closure of said shutter, said first and second switches being arranged between said first conductive means and said converting means in series with each other and in parallel with said controlling means.

3,961,339
AUTOMATIC EXPOSURE CONTROL MEANS FOR SINGLE-LENS REFLEX CAMERA

Kazuhiro Akiyama, Omiya, Japan, assignor to Fuji Photo Optical Co., Ltd., Omiya, Japan

Filed Apr. 8, 1974, Ser. No. 458,897
Claims priority, application Japan, June 19, 1973, 48-68890
Int. Cl.² G03B 7/14
U.S. Cl. 354—29 **10 Claims**



1. An automatic exposure control means for a single-lens reflex camera including therein an electric shutter controlled by an electric circuit the time constant of which is determined by a resistor means connected therein and a swing-up mirror swingably mounted to swing from a reflecting position to a swing-up position upon operation of a shutter release means comprising;

a photo-detector which receives light from the object to be photographed passing through a picture taking lens of the camera;

an exposure meter connected with said photodetector and having a pointer which is moved in accordance with a signal from said photodetector representing the variation in the quantity of light passing through the picture taking lens and received by said photodetector;

a step cam member movable to be in engagement with said pointer so that the position thereof when engaged with the pointer may be determined by the position of the pointer;

a shutter release means which is operated upon depression of a shutter release button;

an exposure control member rotatably mounted to rotate in one direction upon operation of said shutter release means and mechanically connected with said step cam member, said exposure control member associated with the shutter release means so as to be moved by the shutter release means when the shutter is released, said exposure control member being associated with said step cam member to move the step cam member into engagement with said pointer when the shutter is released;

a diaphragm control member associated with a diaphragm to control the diaphragm opening, said diaphragm control member being operatively associated with said exposure control member thereby controlling the diaphragm opening in accordance with the position of said exposure control member;

a shutter speed controlling means including a series of resistors provided in an exposure control circuit for determining the shutter speed, each said resistor having an electric contact, and a sliding contact mounted to said exposure control member to be selectively in contact with the electric contact of said series of resistors; and

a locking means associated with the swing-up mirror of the camera so as to be moved into engagement with said movable member to lock the same when the mirror is swung up and be moved apart from the movable member to release the same when the mirror is returned to the reflecting position;

whereby both the shutter speed and the diaphragm opening are selected upon release of the shutter.

3,961,340

INTEGRATED CIRCUIT HAVING BIPOLAR TRANSISTORS AND METHOD OF MANUFACTURING SAID CIRCUIT

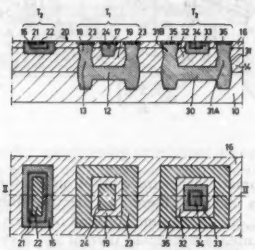
Jean Encinas, Caen, France, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 308,034, Nov. 20, 1972, abandoned. This application Dec. 20, 1974, Ser. No. 535,144

Claims priority, application France, Nov. 22, 1971, 71.41734

Int. Cl.² H01L 27/02

U.S. Cl. 357—40 **11 Claims**



1. A semiconductor device containing at least two bipolar transistors of the same polarity and comprising a semiconductor body, said body comprising

a. a semiconductor substrate comprising at least a surface portion of a first conductivity type;

b. first and second epitaxial layers of said first conductivity type successively disposed on said substrate, said first layer being located between said substrate and said second layer; and

c. said bipolar transistors individually comprising emitter, base, and collector zones, said collector zones being of a second opposite conductivity type, at least a part of said second conductivity type collector zone of a first one of said transistors being disposed at said surface portion and extending along a first interface between said substrate and said first epitaxial layer, at least a part of said collector zone of a second one of said transistors extending along a second interface located between said first and second layers and being at least partly located above said first transistor collector zone, said collector of said first transistor at least partially defining a base region that is located in said first and second epitaxial layers and that has a thickness exceeding the base region of said second transistor, said second transistor base region being located only in said second epitaxial layer.

3,961,341

AUTOMATIC SHUTTER SPEED CONTROL MEANS FOR A CAMERA

Saburo Numata, and Shinichiro Fujino, both of Urawa, Japan, assignors to Fuji Photo Optical Co., Ltd., Japan

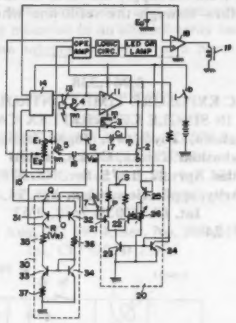
Filed Dec. 11, 1974, Ser. No. 531,601

Claims priority, application Japan, Dec. 13, 1973, 48-140962

Int. Cl.² G03B 7/08

U.S. Cl. 354—51 **2 Claims**

1. A shutter speed control means for controlling operation of shutter mechanism of a camera wherein the scene brightness is detected by a detecting means including a photodetector, and the exposure time is controlled by a shutter control circuit which operates in accordance with the output of said photodetector, said control means comprising: a timing capacitor connected to said shutter mechanism to control the operation thereof under certain conditions; memorizing means to memorize the output voltage of said photodetector; level shifting means to shift the memorized output voltage to a shutter control circuit operating level when the level of the



output voltage memorized by said memorizing means is below a predetermined level, thereby operating said shutter control circuit in accordance with the shifted level, whereby the shutter speed is controlled in accordance with the predetermined shifted level when the scene brightness is below a predetermined level.

3,961,342

REMOTE CONTROL PHOTOGRAPHIC APPARATUS

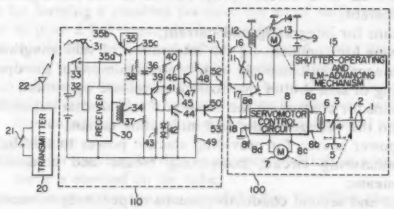
Osamu Maida, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Oct. 10, 1974, Ser. No. 513,868

Claims priority, application Japan, Oct. 12, 1973, 48-118000[U]

Int. Cl.² G03B 9/64

U.S. Cl. 354—60 R **7 Claims**



1. Remote control apparatus for use with a camera having an exposure control system for automatically controlling film exposure, a mechanism for operating a camera shutter and advancing film, first switch means operable for actuating said system, second switch means operable for actuating said mechanism, a manually moveable button, and means coupling the button to both of said switch means for sequentially operating the first switch means and then the second switch means in response to manual movement of the button, said apparatus comprising:

third switch means operable for actuating said system;

fourth switch means operable for actuating said mechanism;

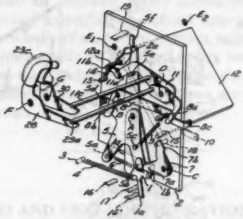
receiver means for producing an output signal in response to a remotely generated photography signal; and

means responsive to said output signal for sequentially operating said third switch means and then said fourth switch means, whereby said exposure control system is actuated before said mechanism for operating the shutter and advancing the film.

3,961,343
METHOD AND ARRANGEMENT FOR MANUAL STOP-DOWN MIRROR-UPS OF SINGLE LENS REFLEX CAMERA

Tetsuji Shono, Ranzan, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 14, 1975, Ser. No. 568,106
Int. Cl.² G03B 19/12
U.S. Cl. 354—156 **11 Claims**

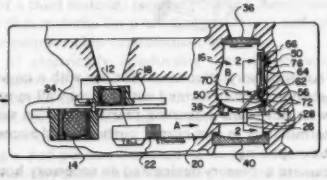


1. A control assembly for manual stop-down mirror-up operations of a single lens reflex camera having a camera ready condition wherein an automatic diaphragm arrangement normally maintains a diaphragm operating member in a full open position and a quick-return mirror arrangement normally maintains a mirror in a viewing position comprising manually operable button means externally mounted on the camera for manual non-depressing movement between first and second button positions and for manual depressing operation in said first and second button positions, said button means being operatively engageable with said automatic diaphragm arrangement in said first button position to bias said diaphragm operating member from said normal full open position to a stop-down position with said mirror in said viewing position upon manual operation of said button means in said first button position and to cause the return of said diaphragm operating member to said normal full open position upon completion of the manual operation of said button means in said first button position, said button means being operatively engageable with said automatic diaphragm arrangement and said quick-return mirror arrangement in said second button position to bias said diaphragm operating member from said normal full open position to said stop-down position and said mirror from said normal viewing position to a mirror-up shutter operating position upon manual operation of said button means in said second button position.

3,961,344
DUAL FIELD VIEWFINDER

Theodor Baisch, Esslingen (Neckar); Kurt Deininger, Stuttgart; Joseph R. Strobel, Stuttgart-Wangen, and Alfred Trumpp, Stuttgart-Uhlbech, all of Germany, assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 29, 1974, Ser. No. 528,046
Int. Cl.² G03B 13/12, 13/08
U.S. Cl. 354—222 **6 Claims**



1. Photographic apparatus comprising a plurality of lenses that can be selectively moved to a first operative position and a viewfinder, said viewfinder comprising:

a pair of reticles of different size;

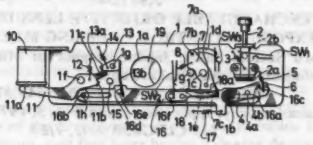
first reflective means for projecting a virtual image of one of said reticles; and

second reflective means, mounted within said photographic apparatus for movement to a second operative position, for projecting a virtual image of the other of said reticles after movement to said second operative position in response to selective movement of one of said plurality of lenses in such photographic apparatus to said first operative position.

3,961,345
OPENING AND CLOSING MEANS FOR ELECTRICALLY CONTROLLED SHUTTERS

Kunio Arisaka, Urawa, Japan, assignor to Copal Company Limited, Japan

Filed July 8, 1974, Ser. No. 486,648
Claims priority, application Japan, July 9, 1973, 48-77361
Int. Cl.² G03B 9/40, 9/58
U.S. Cl. 354—234 **3 Claims**



1. An opening and closing means for electric shutters comprising a pair of shutter blades arranged so as to move substantially in parallel with and in directions reverse to each other; a shutter blade opening and closing member connected to said pair of shutter blades so as to move said pair of shutter blades at the same time in reverse directions during movement of said opening and closing member; an actuating member having thereon an operating member engageable with said shutter blade opening and closing member and arranged (a) to open said blades by engaging with said shutter blade opening and closing member during a first segment of linear movement in one direction of said actuating member and (b) to close said blades by disengaging from said shutter blade opening and closing member during a remaining segment of linear movement in said one direction; an electromagnet located adjacent to said actuating member and arranged to be kept energized during a predetermined exposure time; and an armature member operatively related to said electromagnet and adapted to hold said actuating member, at the end of said first segment of linear movement of said actuating member and while said electro-magnet remains energized, and to release said actuating member for said remaining segment of linear movement at the time when said electromagnet is de-energized at the end of said exposure time.

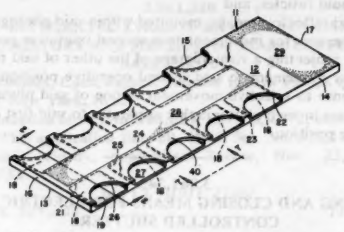
3,961,346
LIQUID INSPECTION SLIDE

Fred K. White, Glen Ellyn, Ill., assignor to Miles Laboratories, Inc., Elkhart, Ind.

Filed Jan. 30, 1975, Ser. No. 545,379
Int. Cl.² G01N 21/16, 1/10
U.S. Cl. 356—244 **10 Claims**

1. A liquid inspection apparatus comprising a transparent organoplastic slide having an outer edge portion and having at least one capillary examination chamber formed therein and extending inwardly from said outer edge portion, said chamber having a flat bottom wall surface and having a flat upper wall surface formed on the underside of a thin flat upper wall

portion, said upper and bottom wall surfaces extending at a slight acute angle from one another to form the capillary chamber therebetween, said upper wall portion being cut



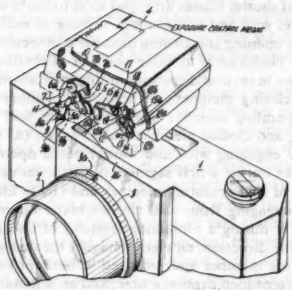
away adjacent said slide outer edge portion to define an outer edge of said upper wall portion extending inwardly in a concave fashion from the outer edge portion of said organoplastic slide.

3,961,347

INTERCHANGEABLE OBJECTIVE LENS DIAPHRAGM EXPOSURE CONTROL COUPLING MECHANISM

Minoru Sekida, Sakai, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jan. 23, 1975, Ser. No. 543,571
Claims priority, application Japan, Feb. 5, 1974, 49-14089
Int. Cl.² G03B 9/02, 7/20
U.S. Cl. 354—272 **11 Claims**



8. A lens interchangeable type camera including a camera body, an objective lens interchangeably mounted on said camera body and having a rotatable diaphragm with a coupler pawl, and a finder housing, comprising,

an exposure control means;

a fixed gear disposed in said camera;

a revolving gear rotatable around said fixed gear and revolvable about its own axis, and an interlocking gear intercoupling said fixed and revolving gears;

a connecting member having one end connected to said revolving gear and being moveable with said revolving gear and its other end connectable with said coupler pawl of said diaphragm ring and moveably interlocking with the movement of said diaphragm ring for moving said revolving gear;

a mounting arm swingable about said fixed gear and rotatably supporting said revolving gear and interlocking gear; and

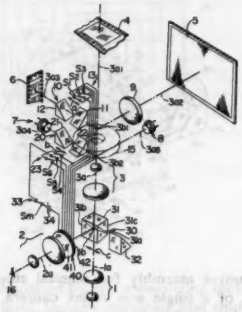
a transmitting means for transmitting the movement of said revolving gear to said exposure control means.

3,961,348

LIGHT PATH SWITCHING INDICATOR FOR OPTICAL INSTRUMENTS

Kensaku Miyazaki, Machida, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Feb. 21, 1975, Ser. No. 551,745
Claims priority, application Japan, Mar. 2, 1974, 49-23754
Int. Cl.² G03B 17/00
U.S. Cl. 354—289 **10 Claims**



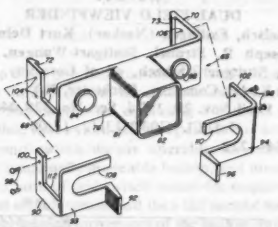
1. A light path switching indicator for use in a viewing instrument comprising first means establishing an objective light path, a plurality of means for establishing separate light paths which are each adapted to be selectively connected with the objective light path, a light path switching mechanism for selectively connecting at least one of the plurality of separate light path establishing means with the objective light path of said first means, a liquid crystal display panel having means for generating a visually observable pattern indicative of that particular one of the separate light paths which is connected with the objective light path, switching means operated in unison with the light path switching mechanism for controlling the liquid crystal display panel.

3,961,349

ACCESSORY MOUNTING ADAPTOR FOR PHOTOGRAPHIC APPARATUS

Robert P. Forsyth, Carlisle, and Gilbert A. Rose, Sr., East Taunton, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 16, 1974, Ser. No. 533,328
Int. Cl.² G03B 17/56
U.S. Cl. 354—295 **7 Claims**



4. An accessory attachment for use with a camera having a lens-shutter housing formed with a front wall mounting a lens, and with side walls extending rearwardly from said front wall and terminating in rear corner portions, said accessory attachment comprising:

a camera accessory device and an accessory housing mounting said accessory device therein, said accessory housing including an accessory-mounting front portion and a pair

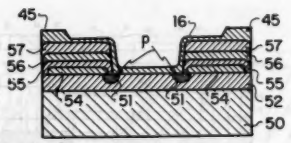
of side wing portions extending rearwardly from said front portion and spaced apart to receive said lens-shutter housing therebetween, said wing portions bearing a pair of opposed latch portions constructed and arranged to releasably engage said rear corner portions to secure said accessory attachment on said lens-shutter housing, said latch portions being relatively movable for manual deflection thereof to engage and disengage said latch portions with said rear corner portions, said wing portions being resiliently flexible and incorporating said latch portions, and a pair of actuator levers connected to said wing portions and extending therefrom into grip portions located forwardly of said front portion, said actuator levers being constructed and arranged to flex said wing portions to spread said latch portions apart to clear said rear corner portions when said grip portions are pressed toward one another.

3,961,350

METHOD AND CHIP CONFIGURATION OF HIGH TEMPERATURE PRESSURE CONTACT PACKAGING OF SCHOTTKY BARRIER DIODES

Karl H. Tiefert, Sunnyvale, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Nov. 4, 1974, Ser. No. 520,328
Int. Cl.² H01L *29/48, 29/34, 23/48, 23/42*
U.S. Cl. 357—15 **7 Claims**



1. A configuration of semiconductor chip having at least one active region for use in a high-temperature seal, pressure-contact lead package, said semiconductor chip configuration comprising:

a semiconductor chip;

a layer of a first material covering the entire semiconductor chip, except at least a portion of the active region thereof, for chemically insulating the semiconductor chip;

a layer of a second material covering the first layer of the first material for chemically insulating the semiconductor chip from reacting with the package impurities;

a layer of the first material covering the layer of the second material for enhancing adhesion thereof with other materials;

a layer of a third material covering the last-mentioned layer of the first material for providing insulation and reducing semiconductor chip capacitance; and

a layer of electrically conducting material covering the entire active region of the semiconductor chip and covering a portion of the layer of third material for physically and electrically contacting a lead,

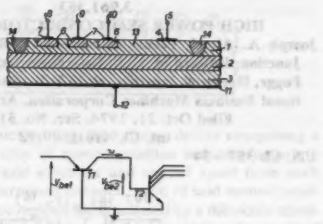
said portion of conducting material over the third material having a pad portion disposed so as to contact said lead at a relatively substantial distance from the active region, thereby to transmit pressure of the contacting lead away from the active region.

3,961,351

IMPROVEMENT IN OR RELATING TO INTEGRATED CIRCUIT ARRANGEMENTS

Victor Blatt, Northampton, England, assignor to Plessey Handel und Investments A.G., Zug, Switzerland

Filed Nov. 7, 1974, Ser. No. 521,893
Claims priority, application United Kingdom, Nov. 8, 1973, 51856/73
Int. Cl.² H01L *29/48, 29/56*
U.S. Cl. 357—15 **7 Claims**



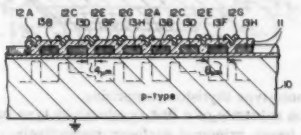
1. An integrated circuit arrangement having at least one pair of superposed transistor structures, the arrangement including first, second and third superposed semiconductive layers, the second layer being interposed between, and of the opposite conductivity type to, the first and third layers and having a doping density higher than the first layer but lower than the third layer; a plurality of electrical contacts formed on a surface of the first layer to provide multi-inputs for the integrated circuit, said first layer having a doping density such that each of said plurality of electrical contacts forms a Schottky diode with the first layer; a plurality of spaced-apart semiconductive regions of the same conductivity type as the second layer formed in the said surface of the first layer; an electrical contact for each of the semiconductive regions to provide multi-outputs for the integrated circuit; and a layer of an electrical contact material formed on a surface of the third layer.

3,961,352

MULTI-RIPPLE CHARGE COUPLED DEVICE

Douglas Roy Colton, Kanata, and Stanley Daniel Rosenbaum, Ottawa, both of Canada, assignors to Northern Electric Company Limited, Montreal, Canada

Filed May 30, 1975, Ser. No. 582,276
Int. Cl.² H01L *29/78;* **H03K** *3/353*
U.S. Cl. 357—24 **3 Claims**



1. A charge coupled device comprising:

a charge storage body;

a row of alternately lower and upper elongated conductive field plates laterally disposed on an insulating layer over said body, each upper field plate overlapping the two adjacent lower field plates;

conductive feed lines contiguously disposed on said insulating layer along the sides of said row; the row being divided into sequential groups of at least four consecutive lower field plates and four consecutive upper field plates, each conductive feed line being connected in each of the sequential groups to a correspondingly located field plate;

means for applying clock voltages to the feedlines of said lower field plates to create potential wells in the charge storage body beneath said lower field plates for the simultaneous storage of charge in all but one of the potential wells in each group, and for sequentially altering the clock voltages applied to the feedlines of the lower and upper field plates in one direction to stepwise transfer charge in an adjacent potential well to said one potential well in the opposite direction.

3,961,353

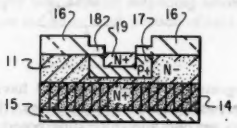
HIGH POWER SEMICONDUCTOR DEVICE

Joseph A. Aboaf, Peekskill; Robert W. Broadie, Hopewell Junction; Edward M. Hull, LaGrangeville, and H. Bernhard Pogge, Hopewell Junction, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 21, 1974, Ser. No. 516,064

Int. Cl.² H01L 29/72

U.S. Cl. 357—34 6 Claims



1. A semiconductor device comprising:

a semiconductor substrate; and,

a porous portion within said substrate doped to form a region of higher conductivity than said substrate.

3,961,354

MESA TYPE THYRISTOR AND ITS MAKING METHOD

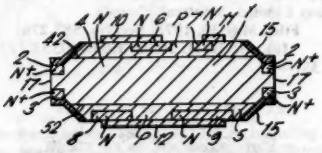
Masahiro Kuwagata, Suita; Masao Yamada, Takatsuki; Kenichiro Nakamura, Nagaokakyo, and Yorisada Kawakami, Osaka, all of Japan, assignors to Matsushita Electronics Corporation, Osaka, Japan

Filed Nov. 19, 1973, Ser. No. 416,799

Claims priority, application Japan, Nov. 17, 1972, 47-115836

Int. Cl.² H01L 29/747, 7/44

U.S. Cl. 357—39 1 Claim



1. A mesa-type thyristor comprising:

a silicon substrate of a first conductivity type having upper and lower principal surfaces respectively on opposite sides of said substrate and a peripheral surface surroundingly extending between said principal surfaces,

said substrate further having a pair of spaced mesa-etched surfaces on said peripheral surface encircling said substrate, mesa-etched

said mesa-etched surfaces having outer peripheral edges respectively at said principal surfaces and extending respectively from said principal surfaces generally toward each other to a predetermined extent to define respective inner peripheral edges spaced apart a given distance,

a pair of first regions of a second conductivity type, opposite said first conductivity type, respectively on said upper and lower principal surfaces for forming PN junctions therewith,

a plurality of additional regions of said first conductivity type formed in said first regions,

electrodes disposed in contact with at least said additional regions, and

a pair of spaced electrodeless semiconductor ring regions of said first conductivity type and having an impurity concentration higher than that of said substrate, said ring regions being only in contact with and formed around said substrate in said peripheral surface and heightwise respectively extending from the said inner peripheral edges of said mesa-etched surfaces toward each other a distance substantially less than said given distance so as to expose between said rings a portion of said substrate which isolates said rings by providing high resistance relative to said rings and hence high breakdown voltage along said peripheral surface and for preventing PN junction leakage current by said ring regions effectively preventing the linking of an inversion layer across said PN junctions.

3,961,355

SEMICONDUCTOR DEVICE HAVING ELECTRICALLY INSULATING BARRIERS FOR SURFACE LEAKAGE SENSITIVE DEVICES AND METHOD OF FORMING

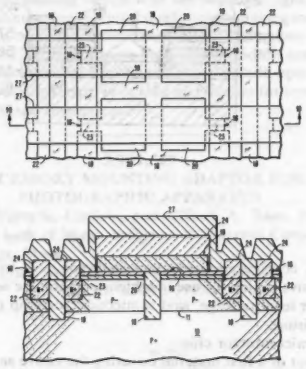
Shakir A. Abbas; Chi S. Chang, both of Wappingers Falls; Leo B. Freeman, Jr., Poughkeepsie, and Ronald W. Knepper, Fishkill, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 267,771, June 30, 1972, abandoned.

This application Nov. 18, 1974, Ser. No. 524,602

Int. Cl.² H01L 27/12

U.S. Cl. 357—49 6 Claims



1. A semiconductor device comprising:

a heavily doped semiconductor substrate;

a lightly doped epitaxial layer overlying a surface of said substrate and having the same conductivity type as said substrate;

an electrically insulating layer disposed on the surface of said epitaxial layer at selected locations and comprising a separate portion at each location;

said epitaxial layer having a surface leakage sensitive device therein beneath each separated portion of said insulating layer;

a plurality of electrically insulating barriers extending from the surface of said epitaxial layer through said epitaxial layer and into said substrate to electrically isolate surface leakage sensitive areas of said devices from each other;

said insulating barriers having a depth greater than the depth of said insulating layer, the depth of said insulating barriers being at least as great as that of said epitaxial layer;

a highly doped diffusion of opposite conductivity type to said substrate and said epitaxial layer disposed in said epitaxial layer and in contact with said insulating barriers;

each of said insulating barriers extending into said substrate for a distance less than the thickness of said substrate and laterally surrounding each said surface leakage sensitive device except where each said barrier is discontinuous to allow a conductive path between said diffusion and a respective one of said surface leakage sensitive devices;

said conductive path comprising the entire thickness of said epitaxial layer

said diffusion and each of said surface leakage sensitive devices being located on opposite sides of said discontinuous barriers; and

each said conductive path constituting a component part of a respective one of said surface leakage sensitive devices.

3,961,356

INTEGRATED CIRCUIT WITH OXIDATION-JUNCTION ISOLATION AND CHANNEL STOP

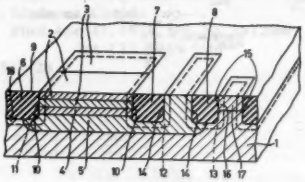
Else Kooi, Emmasingel, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 238,784, March 28, 1972, abandoned. This application Apr. 8, 1974, Ser. No. 458,526

Claims priority, application Netherlands, Apr. 3, 1971, 7104496

Int. Cl.² H01L 27/04

U.S. Cl. 357—50 **7 Claims**



1. A semiconductor device comprising a semiconductor body having a major surface, a pattern of insulating material inset at the major surface in the body over at least part of its thickness to form at least one layer-shaped, surface body part adjoining the inset pattern along its entire circumference and throughout its entire thickness, at least one circuit element having at least first and second regions of a first conductivity type separated by a third region of a second conductivity type, said first and third regions being located entirely in said one layer-shaped body part, said second region having at least a part located in said one layer-shaped body part and said second region part adjoining the inset pattern along its entire circumference, said third region adjoining the inset pattern along at least a part of its circumference and being separated from the major surface at least in part by the first region, and an additional zone in the semiconductor body and adjacent to and bordering the whole of the inset pattern and extending completely between the latter and the remainder of the semiconductor body, said additional zone containing a concentration of second type forming impurities which is smaller than the maximum concentration of first type forming impurities in the second region but still sufficiently large to prevent in the semiconductor adjacent the inset pattern undesired electrical connections between spaced first type regions.

3,961,357

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE

Shinzi Okuhara, Fujisawa, and Ichiro Ohhinata, Yokohama, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Oct. 31, 1974, Ser. No. 519,683

Claims priority, application Japan, Nov. 2, 1973, 48-122761

Int. Cl.² H01L 27/04

U.S. Cl. 357—50 **13 Claims**

1. A semiconductor integrated circuit device comprising a substrate, a plurality of monocrystalline semiconductor regions formed in said substrate and spaced apart from each other by a predetermined distance, each of said monocrystalline semiconductor regions being isolated by a dielectric material, a semiconductor isolation region formed in at least one of said monocrystalline semiconductor regions and extending from the surface thereof by at least a predetermined depth, said semiconductor isolation region having a conductivity type opposite to that of said at least one monocrystalline semiconductor region and said at least one monocrystalline semiconductor region being substantially separated into a plurality of parts by reversely biasing a PN junction between said semiconductor isolation region and said at least one monocrystalline semiconductor region, and at least one circuit element formed in each of the separated parts of said at least one monocrystalline semiconductor region.

3,961,358

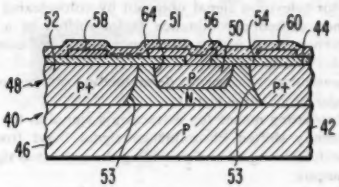
LEAKAGE CURRENT PREVENTION IN SEMICONDUCTOR INTEGRATED CIRCUIT DEVICES

Murray Arthur Polinsky, Somerville, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Feb. 21, 1973, Ser. No. 334,431

Int. Cl.² H01L 29/40

U.S. Cl. 357—53 **6 Claims**



1. In a semiconductor integrated circuit device of the type which includes a body of semiconductive material having a surface, regions in said body bounded by PN junctions extending to said surface, a layer of insulating material on said surface, and conductors overlying said layer of insulating material, said conductors, during operation of said device, being at different potentials whereby charge can leak off a conductor and spread over a finite area of said layer of insulating material to act as a field plate to induce an inversion layer channel in said body therebeneath, the improvement comprising:

a conductor layer on said insulating layer over a portion of the finite area of said insulating layer which lies between one of said PN junctions and a conductor from which charge can leak, for preventing such a field induced inversion layer channel from extending into contact with one of said PN junctions,

portions of said insulating layer which do not lie between said PN junction and a conductor from which charge can leak having no conductor layer thereon.

3,961,359

VIDEO SIGNAL PROCESSING SYSTEM FOR REPRODUCING A VIDEO SIGNAL FROM A BANDWIDTH LIMITED RECORDED SIGNAL

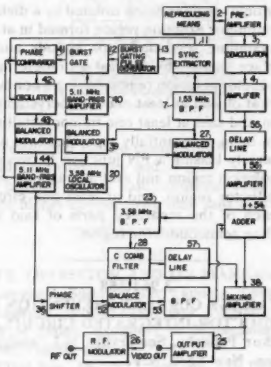
Noboru Okuno, Sennan; Toshiro Kamogawa, and Kosei Kamisaka, both of Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Feb. 20, 1974, Ser. No. 443,994

Claims priority, application Japan, Feb. 20, 1973, 48-20838; Feb. 22, 1973, 48-21462; May 31, 1973, 48-61539; May 31, 1973, 48-61540; July 23, 1973, 48-82950; Aug. 2, 1973, 48-87054; May 31, 1973, 48-64631[U]; May 31, 1973, 48-64632[U]

Int. Cl.² H04N 9/02

U.S. Cl. 358—4 **16 Claims**



14. A video processing system comprising:

a. means for reproducing an angular modulation signal recorded on a recording medium, said angular modulation signal being produced through angular modulation of a color television signal obtained by colorplexing a frequency shifted chrominance signal shifted to a lower frequency band with a luminance signal by using frequency interlacement;

b. a demodulating means for demodulating said reproduced angular modulation signal;

c. an extracting means for extracting a signal in the lower frequency shifted chrominance signal band from the demodulated signal and providing the extracted signal at its output;

d. a first frequency conversion means having an output terminal for frequency converting the extracted signal in the lower frequency shifted chrominance signal band into a first signal in the chrominance signal band of a standard color television signal;

e. a first separating means connected to the output terminal of said first frequency conversion means for separating the chrominance signal from said first signal, said first separating means including a first comb filter including a one-line delay element and providing the separated chrominance signal at its output;

f. a second frequency conversion means for frequency converting the chrominance signal separated by said first separating means to the frequency band of said lower frequency shifted chrominance signal band;

g. an adding means for adding the output of said second frequency conversion means to said demodulated angular modulation signal in opposite phase to each other so that only the lower frequency shifted chrominance signal in said demodulated angular modulation signal in cancelled; and

h. means for mixing the output of said first separating means with the output of said adding means wherein a standard color television signal is obtained as the output of said mixing means.

3,961,360

SYNCHRONIZING DETECTOR CIRCUIT

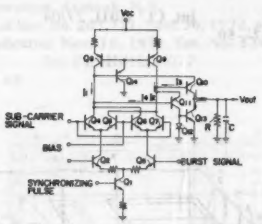
Mitsuya Sato, Kokubunji; Yozo Tanihara, and Makoto Furihata, both of Kodaira, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Sept. 9, 1974, Ser. No. 504,364

Claims priority, application Japan, Sept. 7, 1973, 48-100180

Int. Cl.² H04N 9/50; H03D 3/18, 13/00

U.S. Cl. 358—27 **11 Claims**



1. In a synchronizing detector circuit which includes:

at least two differentially connected first conductivity type transistors;

a constant current circuit composed of a pair of second conductivity type transistors having their collectors respectively connected to the collectors of the differentially connected transistors, their bases connected to each other, and their emitters connected to a supply voltage;

a filter; and

a second conductivity type output transistor having its base connected to a juncture between one of the said differentially connected transistors and one of the transistors of said constant current circuit and its collector connected to said filter circuit;

a first signal being applied to the base of one of the said differentially connected transistors, and a second signal being applied to the emitters thereof;

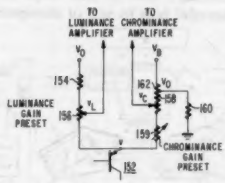
the improvement comprising:

means connected between the other of the junctures between the second of said differentially connected transistors and the other of the transistors of said constant current circuit and said filter circuit for preventing the occurrence of an offset voltage in said filter circuit due to noise.

3,961,361
GAIN CONTROL ARRANGEMENT USEFUL IN A TELEVISION SIGNAL PROCESSING SYSTEM

Jack Avins, Princeton, and Bernard Joseph Yorkanis, South Plainfield, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed May 23, 1975, Ser. No. 580,690
Int. Cl.² H04N 9/12
U.S. Cl. 358—27 11 Claims



3. In a color television signal processing system of the type including luminance and chrominance signal processing channels, apparatus comprising:

first and second amplifiers respectively included in said luminance and chrominance channels, said amplifiers having gain control voltage characteristics including linear portions extrapolated to cut-off at substantially the same predetermined voltage;

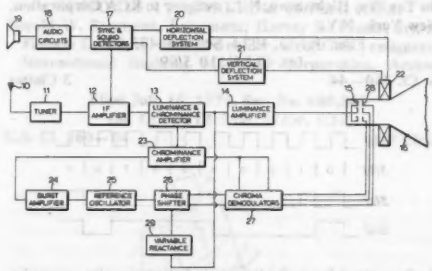
a source of gain controlling voltage; and

means for coupling said gain controlling voltage to said first and second amplifiers.

3,961,362
DYNAMIC HUE CONTROL NETWORKS

John D. Lovely, Waterloo, Canada, assignor to Electrohome Limited, Kitchener, Canada

Filed Apr. 11, 1975, Ser. No. 567,060
Int. Cl.² H04N 9/46
U.S. Cl. 358—28 7 Claims



1. In a colour television receiver comprising means responsive to a composite colour television signal, which signal includes a luminance component and a colour subcarrier component modulated with chrominance information, for reconstituting a colour image, which means include a demodulator coupled to a source of chrominance signal and to a source of colour reference signal for developing a colour control signal, means for automatically increasing the phase angle between said reference signal and said chrominance signal when said luminance signal moves toward a signal representing black and for automatically decreasing said phase angle when said luminance signal moves toward a signal representing white, the last mentioned means including a variable phase shift network for varying said phase angle, means for deriving a signal that varies with the level of said luminance signal, and means for applying the derived signal to said variable phase shift network to automatically vary the phase shift imparted by said network such that said phase angle increases and decreases as said luminance signal moves towards signals representing black and white respectively.

3,961,363
COLOR PICKUP TUBES

Hayao Kohzai, Mobara, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

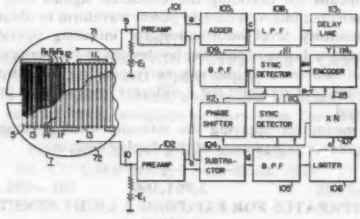
Filed Sept. 17, 1974, Ser. No. 506,790
Claims priority, application Japan, Nov. 5, 1973, 48-123421
Int. Cl.² H04N 9/07; H01J 31/26
U.S. Cl. 358—43 5 Claims

1. In a vidicon type colour pickup tube for use in a colour television camera system of the type comprising a glass envelope, a transparent glass substrate sealed to one end of said envelope, an optical colour analyzing stripe filter disposed on the rear surface of said glass substrate, a transparent film formed on said filter, a transparent electroconductor film formed on said transparent film and a photoconductor film formed on said electroconductor film, the improvement wherein the thickness of said transparent film is increased gradually from the central portion toward the peripheral portion of said transparent film.

3,961,364
COLOR TELEVISION CAMERA

Hiromichi Tanaka, Neyagawa, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Nov. 26, 1974, Ser. No. 527,267
Claims priority, application Japan, Nov. 27, 1973, 48-133883
Int. Cl.² H04N 9/07
U.S. Cl. 358—46 12 Claims



1. A color television camera for generating an electrical signal corresponding to an object to be televised, comprising:

a photoconductive surface adapted to convert an image focused thereon into an electrical signal;

a striped color filter disposed between said object and said scanning surface and adapted to form on said scanning surface a color separated image in accordance with the color components of said object;

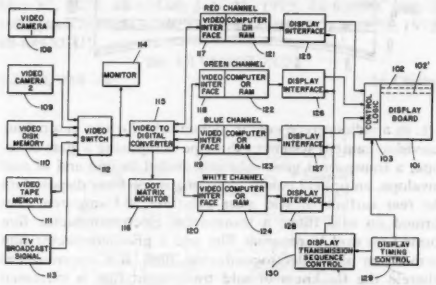
a signal electrode divided into a plurality of separate electrode segments, at least one of said plurality of separate electrode segments consisting of a plurality of elements each having a width greater than the recurrence cycle of the filter-element sets in said striped color filter, each of said elements provided with a plurality of beam current interrupting portions arranged at predetermined intervals smaller than said recurrence cycle; and

circuit means adapted for generating from the signals derived from said plurality of electrode segments by the scanning of the electron beam an index signal for generating a color video signal.

3,961,365
COLOR DISPLAY DEVICE

Robert A. Payne, Des Plaines, and Gregory E. Slobodzian, Chicago, both of Ill., assignors to Stewart-Warner Corporation, Chicago, Ill.

Filed Oct. 24, 1974, Ser. No. 517,520
Int. Cl.² H04N *9/30*
U.S. Cl. 358—56 **19 Claims**



1. A system capable of at least eight levels of light intensity for displaying color images on a plurality of visual display devices forming a cluster operated by application of a periodic power waveform, said cluster display devices arranged in modules to form a full display matrix comprising:

a. a source of video color signals;

b. a video to digital signal converter producing digital signals therefrom;

c. means for storing said digital signals; in matrix form;

d. means for extracting the digital signals from said storage means;

e. means for transmitting the extracted signals to said display devices;

f. means for decoding the extracted signals only during selected intervals on said power waveform to obtain color intensity level information for initiating operation of selected ones of said display devices at each interval, each of said selected intervals corresponding to a display device turn on point for a different level of light intensity; and

g. means for applying the intensity level information to predetermined ones of the display devices.

3,961,366
APPARATUS FOR EXPOSING A LIGHT-SENSITIVE LAYER

Paul Weishaupt, Oberburg, Switzerland, assignor to Wagner & Cie AG, Burgdorf, Switzerland

Division of Ser. No. 355,919, April 30, 1973, Pat. No. 3,897,250. This application June 10, 1974, Ser. No. 478,355
Claims priority, application Switzerland, May 15, 1972, 7183/72
Int. Cl.² H04N *5/84*
U.S. Cl. 358—80 **3 Claims**

1. An apparatus for exposing a light-sensitive layer serving to make reproductions of black-and-white or color patterns comprising in combination:

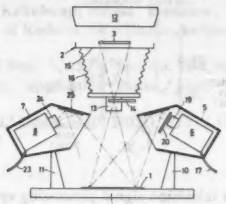
a support table for the light sensitive layer;

a purely optical projection means for projecting a first image of a pattern onto the light-sensitive layer when positioned on the support table;

an electronic camera means for scanning the projected pattern image and for generating video signals of the image of the pattern projected onto the light-sensitive layer;

a video recording means operatively connected with the electronic camera means for storing the video signals on a recording carrier;

control means operatively connected with said video recording means for selecting a stored video signal corresponding to a second image to be projected onto the light-sensitive layer; and



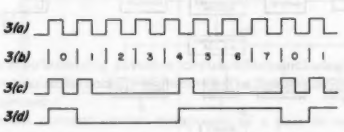
an electro-optical projection means receiving said selected stored video signal from said video recording means for projecting said second image of the pattern onto the light-sensitive layer to be exposed, to thereby correct the contrast of color shades or both of the first projected pattern image;

said purely optical projection means and said electro-optical projection means being positionally disposed such that said first and second images of the pattern projected onto the light-sensitive layer by said purely optical projection means and said electro-optical projection means substantially coincide.

3,961,367
SELF-CLOCKING, ERROR CORRECTING LOW BANDWIDTH DIGITAL RECORDING SYSTEM

Chin Tao Wu, Hightstown, N.J., assignor to RCA Corporation, New York, N.Y.

Filed July 3, 1974, Ser. No. 485,520
Int. Cl.² G11B *5/09*
U.S. Cl. 360—44 **3 Claims**



1. A method for recording digital data signals comprising the steps of:

recording a pulse to identify the beginning of each cell time;

recording one digital value by a single change in polarity of the recorded signal during the cell time; and

recording another digital value by maintaining the same polarity of the recorded signal during the cell time.

3,961,368
APPARATUS FOR RECORDING AND REPRODUCING DIGITAL DATA

Wayne R. Herbst, Northbrook, and Paul L. Mika, Des Plaines, both of Ill., assignors to Teletype Corporation, Skokie, Ill.

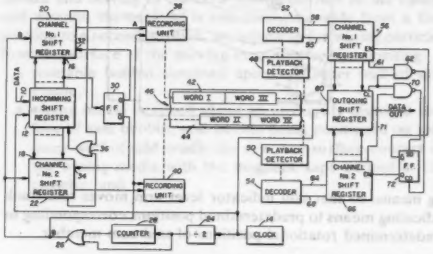
Filed Nov. 20, 1974, Ser. No. 525,435
Int. Cl.² G11B *5/09*
U.S. Cl. 360—48 **6 Claims**

1. An apparatus for recording an informational signal composed of a series of digital words upon an elongated magnetic

tape defining at least two continuous, parallely oriented informational channels comprising:

means for splitting said informational signal into at least two groups of digital words said input signal splitting means serving to direct consecutive words of the incoming signal into separate groups so that each group consists of complete non-consecutive ones of the digital words comprising the information signal;

means for concurrently recording each group of digital words upon one of said channels so that each group corresponds to one of said informational channels;



means for detecting the digital words recorded upon each of said channels, said detecting means including at least two playback detectors, each playback detector being associated with one of said channels and providing a signal corresponding to the digital information recorded upon the related channel; and

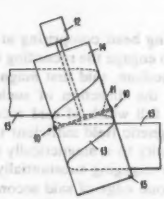
means for combining the digital signals from said detecting means in their original incoming order so as to provide an output signal having a word arrangement corresponding to the word arrangement of the incoming recorded signal.

3,961,369

ROTATING HEAD APPARATUS HAVING A PROTRUDING DIAMETER HEADWHEEL WHICH SUPPORTS A PROTRUDING FLYING HEAD

Gerald W. Baumann, Longmont; Harvey R. Fraser, Jr., and Francis E. Hauke, both of Boulder, all of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed July 15, 1974, Ser. No. 488,341
Int. Cl.² G11B 5/60, 21/04, 5/52
U.S. Cl. 360—84 **9 Claims**



1. Apparatus for uniformly supporting magnetic tape along the path of a rotating noncontact head for reading and/or writing information in magnetic domain tracks, said apparatus comprising:

first and second spaced tape support means cooperating to form a first level of support for supporting the tape;

a rotor operably mounted intermediate said support means and cooperating to form a second level of support;

said rotor having an annual surface whose outer diameter extends radially beyond said support means and being operable to support the tape with a gas bearing along the path of said rotor, to thereby produce localized tape deflection coincident with said path; and

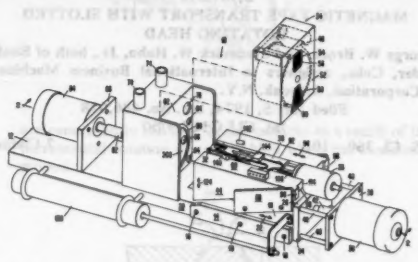
a noncontact head mounted on said rotor and extending radially beyond the outer diameter thereof, to thereby produce a third level of support and a moving tent of localized tape deflection coincident with said head.

3,961,370

RAPID ACCESS STORAGE DEVICE

John William Wenner, Boulder, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 20, 1974, Ser. No. 534,973
Int. Cl.² G11B 23/04, 15/58, 5/78
U.S. Cl. 360—93 **33 Claims**



1. Single reel magnetic media unit apparatus, comprising:

a stationary tapered-wall vacuum column positioned on one side of said reel,

driving means operably connected for reversibly rotating said reel about its axis,

a stationary friction surface positioned on the opposite side of said vacuum column,

first force means operable for loading said magnetic media against the friction surface, whereupon rotation of said reel produces rapid transfer of tape layers from previously formed inner bale and outer bale, said inner and outer bales being separated by a space, and

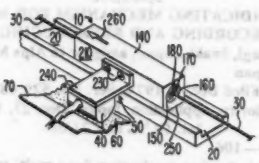
second force means operable for loading said magnetic media against a reel flange of said reel, whereupon rotation of said reel produces sequential transfer of tape layers between the inner and outer bales.

3,961,371

VIBRATION ABSORPTION SYSTEM FOR A CARD READING MECHANISM

Lawrence P. Kobylarz, Howell, and Ronald H. Mack, Plymouth, both of Mich., assignors to Burroughs Corporation, Detroit, Mich.

Filed Dec. 20, 1974, Ser. No. 534,679
Int. Cl.² G11B 21/02, 21/18; G06K 7/01
U.S. Cl. 360—101 **25 Claims**



12. A device for dampening external excitations below the response level of an associated read head, the read head being a part of a reader apparatus including a magnetic stripe operative to be read by the read head, a track means guiding the read head for movement along the longitudinal axis of the magnetic stripe, and a drive cable for moving the read head, the device comprising:

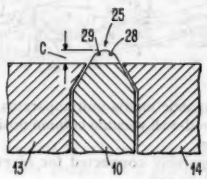
a. housing means mounting said magnetic stripe reading head,
b. a damping element of predetermined density and compressible resiliency disposed within said housing means, and
c. means responsive to the starting and stopping of said drive cable and said reading head effective for applying a constant bias to said damping element whereby the frequency vibrations caused by the starting and stopping excitation of the drive cable are reduced below said response level of said reading head.

3,961,372

MAGNETIC TAPE TRANSPORT WITH SLOTTED ROTATING HEAD

George W. Brock, and Frederick W. Hahn, Jr., both of Boulder, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed July 5, 1974, Ser. No. 486,028
Int. Cl.² G11B 5/60
U.S. Cl. 360—102 **7 Claims**



1. A rotating magnetic transducer for magnetically reading and writing information from a flexible information-storage media which flies relative to said rotating magnetic transducer, comprising:
a flying flexible information-storage media having a magnetizable surface,
a head having pole pieces with transducing interface rotating relative to said media,
said transducing interface having a spherical surface and including a transducing gap with at least two parallel surface slots, being positioned in the pole pieces of said head, and extending in the general direction of said transducer movement, perpendicular to said transducing gap and positioned one on each side of the transducing gap, and
support means to rotate said head so that an air bearing is generated thereby enabling the storage media to fly with microinch adjacency to the transducing interface of the head.

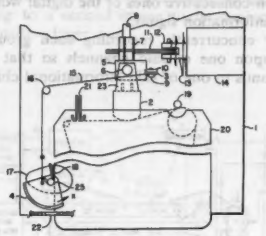
3,961,373

TRACK INDICATING MECHANISM FOR MAGNETIC TAPE RECORDING AND REPRODUCING DEVICE

Susumu Takagi, Iwaki, Japan, assignor to Alps Motorola, Inc., Tokyo, Japan

Filed Dec. 4, 1974, Ser. No. 529,483
Claims priority, application Japan, Dec. 27, 1973, 49-4914
Int. Cl.² G11B 21/08
U.S. Cl. 360—106 **5 Claims**

1. A track indicating mechanism for a multi-track magnetic tape recording and/or reproducing device including in combination: a frame member; a cam member mounted for rotation in said frame member and movable in accordance with a track changing operation of the magnetic tape device; an indicator lever arm having a cam follower portion abutting said cam member and pivotally mounted at one end on said frame member; a spring; track indicating means urged in a predetermined direction by said spring; and linking means connecting the other end of said indicator lever arm to said track indicating means for constantly resiliently urging said cam follower portion of said indicator lever arm against said cam member through the forces applied by said spring to said track indicating means, so that said indicator lever arm moves said track indicating means to predetermined positions corresponding to predetermined rotational positions of said cam member.

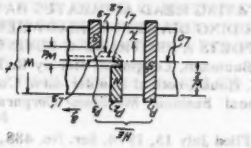


3,961,374

STATIC MAGNETIC ERASE HEAD

Nobuyuki Murata, Yokohama, and Makoto Saito, Omiya, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Sept. 27, 1974, Ser. No. 509,946
Claims priority, application Japan, Oct. 2, 1973, 48-110867
Int. Cl.² G11B 5/12
U.S. Cl. 360—118 **9 Claims**



1. A magnetic erasing head comprising at least three magnetic poles arranged to engage the recording track of a moving magnetic recording medium, said first magnetic pole extending perpendicular to the direction of such movement and engaging at least the full width of said recording track and providing a static magnetic field sufficient to magnetize said track with a first polarity to a magnetically saturated state, a second magnetic pole engaging substantially one-half of said recording track with one edge of said second pole extending beyond one edge of the recording track, the other edge of said pole being spaced from the centerline of the recording track on the same side as said one edge of the recording track, said second pole providing a static magnetic recording field which is greater than the maximum coercive force of the magnetic recording medium, said second pole having a polarity opposite to that of the first pole, said third magnetic pole engaging the other half of said recording track below said centerline and providing a static magnetic field to said magnetic recording medium which is greater than the minimum coercive force of the magnetic recording medium, said third pole having a polarity the same as the first pole, said first, second and third magnetic poles being spaced in the direction of such movement with said second pole between said first and third poles.

3,961,375

APPARATUS FOR CLEANING AN INFORMATIONAL TAPE

Paul L. Mika, Des Plaines; Kurt Rothlisberger, Morton Grove, and Richard F. Vee, Chicago, all of Ill., assignors to Teletype Corporation, Skokie, Ill.

Filed July 15, 1974, Ser. No. 488,623

Int. Cl.[2] G11B *5/00*

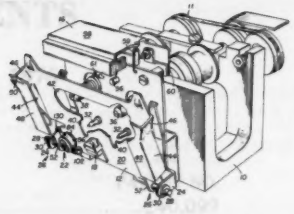
U.S. Cl. 360—137 **13 Claims**

1. In combination with a cassette recorder having a cradle defining a cavity for receipt of a cassette containing a magnetic tape, wherein the cradle has an inner wall disposed toward and serving to define at least a portion of the cavity, and wherein the cassette is selectively movable from a first position to a second position, an apparatus for wiping particles from the surface of the moving magnetic tape comprising:

a rotatable bobbin mounted upon said inner wall of said cradle;

a wiping media wrapped about an outwardly disposed surface of said bobbin, said bobbin being positioned on said inner wall of said cradle for selective surface contact of the wiping media with the magnetic tape carried in the cassette; and

means, actuated by movement of the cassette from the first to the second position for incrementally rotating said bobbin so that successive segments of the wiping media



are presented to the tape in the cassette as a result of the incremental rotation of said bobbin when the cassette is moved.

DESIGN PATENTS

GRANTED JUNE 1, 1976

ERRATA

For CLASS	See PATENT NO.
007–137	240,099
025–035	240,126
016–015	240,160
016–014	240,161
016–031	240,162

DESIGN PATENTS

GRANTED JUNE 1, 1976

ERRATA

Re

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007–127
025–035
016–015
016–014
016–021

Re

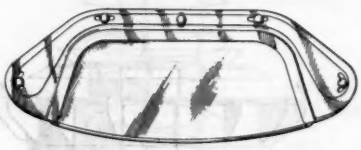
PATENT NO.
240,099
240,172
240,160
240,161
240,162

DESIGNS

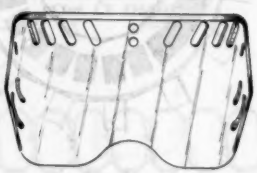
JUNE 1, 1976

240,091
DIAPER COVER
Yoshizo Okuda, 3–16 Gakuenkita 1-chome, Nara, Japan
Filed Sept. 9, 1974, Ser. No. 504,065
Term of patent 14 years
Int. Cl. D2—*01*
U.S. Cl. D2—10

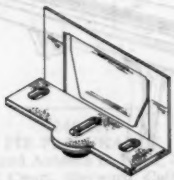
240,092
DETACHABLE FLEXIBLE FACE SHIELD FOR FITTING THE CURVATURE OF A HELMET
Kenard E. Urion, Dover, Del., assignor to ILC Industries, Inc., Frederica, Del.
Filed Jan. 29, 1975, Ser. No. 545,060
Term of patent 14 years
Int. Cl. D2—*03*
U.S. Cl. D2—233



240,093
FACE SHIELD FOR ATTACHMENT TO HELMET
John W. Meadows, Natick, Mass., assignor to M.G.S., Inc., Framingham, Mass.
Filed May 15, 1975, Ser. No. 577,729
Term of patent 14 years
Int. Cl. D2—*03*
U.S. Cl. D2—233



240,094
BELT-ATTACHED CAMERA CARRIER
Arnoldo D. Linn and Berta Cortes, both of 2046 Greenwich St., San Francisco, Calif. 94123
Filed Nov. 21, 1974, Ser. No. 526,025
Term of patent 14 years
Int. Cl. D2—*07*
U.S. Cl. D2—400

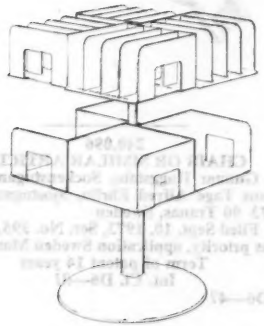


240,095
TOOTHBRUSH
Arnold Sims, Beachwood, Ohio, assignor to Vistron Corporation, Cleveland, Ohio
Filed Apr. 10, 1974, Ser. No. 459,552
Term of patent 14 years
Int. Cl. D4—*02*
U.S. Cl. D4—15

240,096
CHAIR OR SIMILAR ARTICLE
Christian Gunnar Haggstam, Sockenstugan, Kyrkskolan, and Hans Tage Alfred Ehrlin, Sjostugan, Hatte, both of S–573 00 Tranas, Sweden
Filed Sept. 10, 1973, Ser. No. 395,406
Claims priority, application Sweden Mar. 12, 1973
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—47

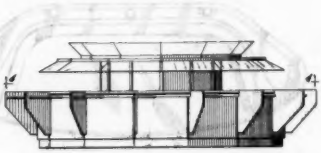
240,097
GARDEN BENCH
Theodor M. Box, 1108 Aileen Road, Brielle, N.J. 08730
Filed Apr. 10, 1975, Ser. No. 566,796
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—60

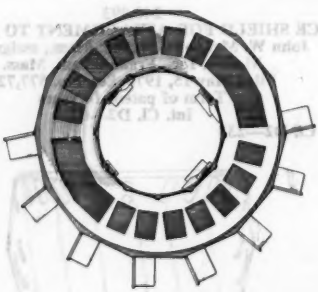
240,098
COMBINED FILE AND DISPLAY RACK
Sven-Eric Juhlin, Gustavsberg, Sweden, assignor to AB Gustavsbergs Fabriker, Gustavsberg, Sweden
Filed Dec. 24, 1974, Ser. No. 536,170
Claims priority, application Sweden July 11, 1974
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—24



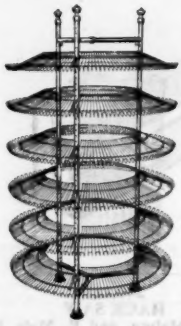
240,099
SPOON OR SIMILAR ARTICLE
Melvin A. Lea, Oneida, N.Y., assignor to Oneida Ltd., Oneida, N.Y.
Filed Feb. 18, 1975, Ser. No. 550,168
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D7—137

240,100
COMBINED ROTATING CAFETERIA TYPE FOOD SERVICE COUNTER AND DISPLAY SHELF
Elmer R. Weddendorf, 2541 N. Bend Road, Apt. 4, Cincinnati, Ohio 45239
Filed Sept. 3, 1974, Ser. No. 502,566
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—146

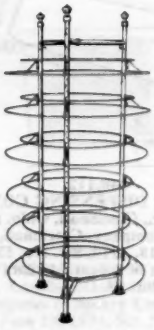




240,101
DISPLAY RACK FOR SHOES OR THE LIKE
Roland Redler, 8 Sundeliusgatan,
602 35 Norrkoping, Sweden
Filed Jan. 8, 1975, Ser. No. 539,550
Term of patent 7 years
Int. Cl. D20—*02*
U.S. Cl. D6—146

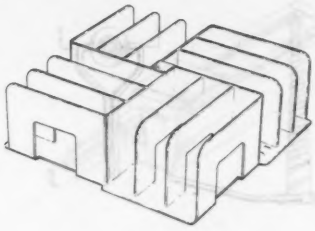


240,102
DISPLAY RACK FOR SHOES OR THE LIKE
Roland Redler, 8 Sundeliusgatan,
602 35 Norrkoping, Sweden
Filed Jan. 8, 1975, Ser. No. 539,551
Term of patent 7 years
Int. Cl. D20—*02*
U.S. Cl. D6—146



240,103
BANK OF LOCKERS FOR BICYCLES, MOTORCYCLES OR THE LIKE
Benjamin Agundez III, 5930 Franklin,
Los Angeles, Calif. 90028
Filed Oct. 29, 1974, Ser. No. 518,320
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—157

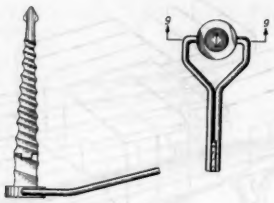
240,104
COMBINED FILE AND DISPLAY RACK
Sven-Eric Juhlin, Gustavsberg, Sweden, assignor to AB
Gustavsbergs Fabriker, Gustavsberg, Sweden
Filed Dec. 24, 1974, Ser. No. 536,169
Claims priority, application Sweden July 11, 1974
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—189



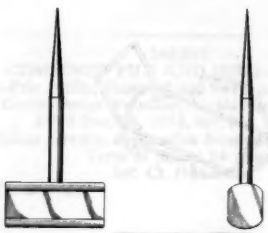
240,105
PIE PAN CRADLE
John C. Boyd and Antonia D. Boyd, both of 21654
Cherryland Court, Hayward, Calif. 94541
Filed July 1, 1974, Ser. No. 484,900
Term of patent 14 years
Int. Cl. D7—*06*
U.S. Cl. D7—130

240,106
TABLE FORK
Chokichi Sato, 16–11 Higashi-Nippori 5-chome,
Arakawa-ku, Tokyo, Japan
Filed May 29, 1974, Ser. No. 474,211
Claims priority, application Japan Dec. 29, 1973
Term of patent 3½ years
Int. Cl. D7—*01*
U.S. Cl. D7—137

240,107
SPIRAL FID FOR HAWSERS
James D. McGrew, 8120 Rio Linda Blvd., Elverta, Calif. 95626
Filed Mar. 21, 1975, Ser. No. 560,804
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—14

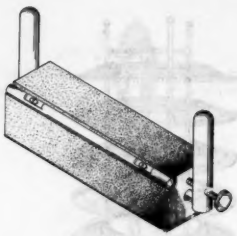


240,108
COMBINED FID AND AWL
James D. McGrew, 8120 Rio Linda Blvd., Elverta, Calif. 95626
Filed Apr. 3, 1975, Ser. No. 564,610
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—14

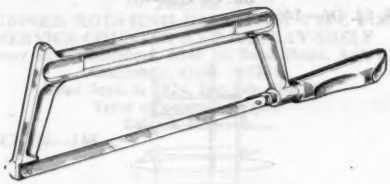


240,109
VACUUM PICK-UP FOR WAFERS
Bruce K. Miller, Mesa, and T. John Trayes, Phoenix, Ariz., assignors to Motorola, Inc., Chicago, Ill.
Filed Mar. 28, 1974, Ser. No. 455,849
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—71

240,110
UNIVERSAL SANDING BLOCK
Jose A. Lugo, Ridgewood, N.Y., assignor to Jose A. Lugo, Ridgewood, N.Y.
Filed Oct. 2, 1974, Ser. No. 511,169
Term of patent 7 years
Int. Cl. D8—*05*
U.S. Cl. D8—90



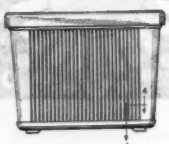
240,111
HACK SAW
Carl-Arne Breger, Malmo, and P. Mats A. Danielsson, Sandviken, Sweden, assignors to Sandvik Aktiebolag, Sandviken, Sweden
Filed Apr. 8, 1975, Ser. No. 566,053
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—96



240,112
PRESSURIZED DISPENSING CONTAINER
William J. O'Neil, Jr., Cincinnati, Ohio, assignor to The Drackett Company, Cincinnati, Ohio
Filed Dec. 18, 1974, Ser. No. 533,859
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—9

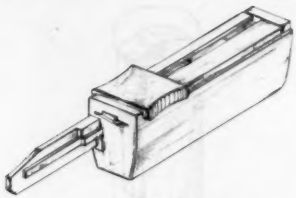
240,113
CONTAINER FOR PULVERULENT MATERIALS
George R. Conrad, Chicago, Ill., assignor to Blue Cross Laboratories, Inc., North Hollywood, Calif.
Filed Oct. 24, 1974, Ser. No. 517,725
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—146

240,114
STORAGE CONTAINER FOR FOOD OR THE LIKE
Arnold C. Martinelli, Lake Shore Drive, Rawdon, Quebec, Canada
Filed Mar. 27, 1974, Ser. No. 455,337
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—219



240,115
TYPE BALL CONTAINER
Lewis H. Herr, Lansdale, and John S. Kovacs, Norristown, Pa., assignors to Sperry Univac, Blue Bell, Pa.
Filed June 19, 1974, Ser. No. 480,610
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—222

240,116
RAZOR BLADE DISPENSER
Norman D. Poisson, Andover, Mass., assignor to The Gillette Company, Boston, Mass.
Continuation-in-part of design application Ser. No. 366,559, June 4, 1973, now Patent No. 235,135. This application Jan. 22, 1974, Ser. No. 435,537
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D9—224

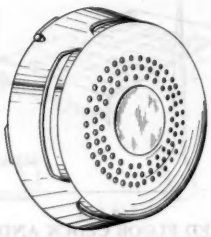


240,117
STACKING INSERT FOR CONTAINERS
Hans Ake Hilding Skagmo, Helsingborg, Sweden, assignor to Svenska Elopak, Helsingborg, Sweden
Continuation-in-part of design application Ser. No. 216,324, Jan. 7, 1972. This application July 19, 1973, Ser. No. 380,828
Term of patent 14 years
Int. Cl. D9—*99*
U.S. Cl. D9—294

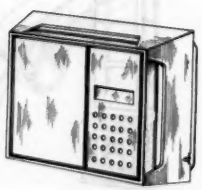
240,118
COMBINED FLOOR CLOCK AND CURIO CABINET
Leonard Eisen, 14 Lomas Lane, Montvale, N.J. 07645
Filed Oct. 19, 1973, Ser. No. 407,785
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—16

240,119
METAL DETECTOR CASE
Gilbert Y. Y. Yue, Hong Kong, and Beatrice Siu Hween Koot, San Francisco, Calif. (both of 771 45th Ave., San Francisco, Calif. 94121)
Filed Jan. 6, 1975, Ser. No. 538,752
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D10—47

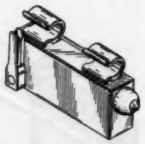
240,120
COMBUSTION PRODUCTS DETECTOR
Ralph E. Pasquarette, Jordan, Minn., assignor to Honeywell Inc., Minneapolis, Minn.
Filed Nov. 21, 1974, Ser. No. 525,784
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D10—106



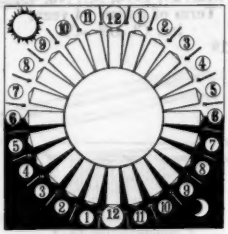
240,121
COMBUSTION PRODUCTS DETECTOR
Ralph E. Pasquarette, Jordan, Minn., assignor to Honeywell Inc., Minneapolis, Minn.
Filed Nov. 21, 1974, Ser. No. 525,792
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D10—106



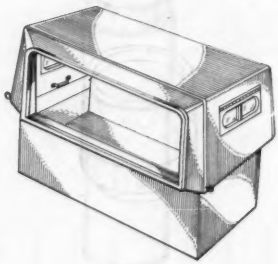
240,122
FISHING SIGNAL
Theodore Montgomery, Box 43, and Wayne T. Wise, Box 175, both of Frankfort, S. Dak. 57440
Filed Mar. 6, 1975, Ser. No. 555,744
Term of patent 14 years
Int. Cl. D10—*06;* D26—*02*
U.S. Cl. D10—114



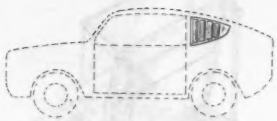
240,123
FACE PLATE FOR SURROUNDING THE DIAL OF AN INTERNATIONAL TIME CLOCK
Tancredi E. De Lorenzo, 20000 Woodside, Harper Woods, Mich. 48225
Filed July 29, 1974, Ser. No. 492,449
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D10—123



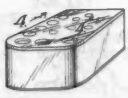
240,124
AUXILIARY HOUSING FOR PICKUP TRUCKS
Harold G. Phillips, Rte. 3, Box 103A, Pasadena, Md. 21122
Filed Mar. 24, 1975, Ser. No. 561,543
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—156



240,125
AUTOMOBILE WINDOW LOUVER
Henry Bolden, 70 Peck St., New Haven, Conn. 06513
Filed Mar. 24, 1975, Ser. No. 561,248
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—181

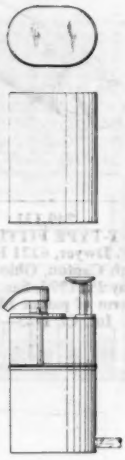


240,126
STAGE SECTION
Michael J. Mujadin, Fort Lauderdale, Fla., assignor to Early Grey Associates, Fort Lauderdale, Fla.
Filed Apr. 22, 1974, Ser. No. 462,971
Term of patent 14 years
Int. Cl. D25—*35*
U.S. Cl. D13—1 R

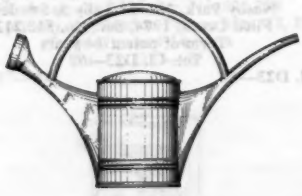


240,127
FISHERMAN'S IMPLEMENT
Kenneth John McDonald, Pyrmont, New South Wales, Australia, and John Bunyan, Redfern, New South Wales, Australia, assignors to K-tel International, Inc.
Filed Nov. 4, 1974, Ser. No. 520,902
Claims priority, application Australia May 3, 1974
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—31

240,128
WATER PURIFIER
William H. Stephens and David R. Jones, Albuquerque, N. Mex., assignors to Water Pollution Control Systems, Inc., Dallas, Tex.
Filed Apr. 29, 1974, Ser. No. 464,777
Term of patent 7 years
Int. Cl. D23—*01*
U.S. Cl. D23—3

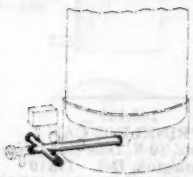


240,129
SPRINKLING CAN
Edward C. Grotz, 20 E. Dale Road, Northfield, Wilmington, Del. 19810
Filed Aug. 7, 1974, Ser. No. 495,394
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—11

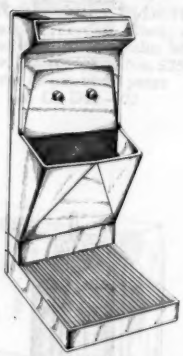


240,130
AIR PUMP FOR CAMPING STOVES
William Albert Folke, Upplands Vasby, Sweden, assignor to Aktiebolaget Optimus, Upplands Vasby, Sweden
Filed Aug. 5, 1975, Ser. No. 602,183
Claims priority, application Sweden Feb. 5, 1975
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—15

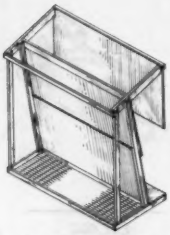
240,131
T-TYPE FITTING
Patrick F. Dwyer, 6221 Hillfield NW., North Canton, Ohio 44720
Filed May 19, 1975, Ser. No. 578,467
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—40



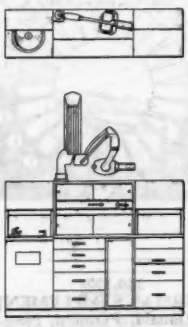
240,132
URINAL
Gunnar Torbjorn Lofgren, Krakuddsvagen 23, Nasby Park, 183 51 Taby 3, Sweden
Filed Oct. 8, 1974, Ser. No. 513,212
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—68



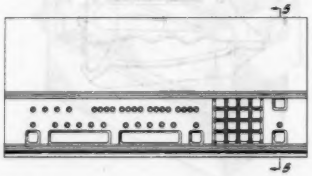
240,133
COMBINED AIR INTAKE AND VECTOR CONTROL FOR AGRIBUILDINGS
Donald L. De Myer, % Cycle Systems, Inc., 9290 Belding Road NE., Rockford, Mich. 49341
Filed Feb. 11, 1975, Ser. No. 548,901
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—139



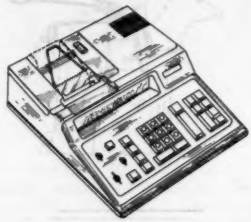
240,134
DENTAL CABINET
David D. Pierson, Pittsford, N.Y., assignor to Sybron Corporation, Rochester, N.Y.
Filed July 8, 1974, Ser. No. 486,360
Term of patent 14 years
Int. Cl. D6—*04*; D24—*01*
U.S. Cl. D24—1 B



240,135
COMPUTER CONTROL PANEL
Kenneth C. Gorman, Mission Viejo, Robert E. Kopicki, Newport Beach, Joseph C. Reiss, Hemet, and Ronald E. Loosen, Malibu, Calif., assignors to Computer Automation, Inc., Irvine, Calif.
Filed Apr. 30, 1973, Ser. No. 355,936
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5 C

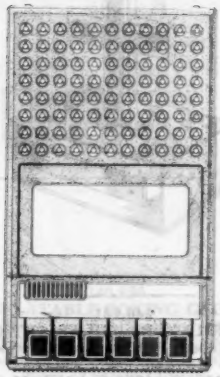


240,136
ELECTRONIC CALCULATING MACHINE
Shigetoshi Hazama, Osaka, Japan, assignor to Sharp Kabushiki Kaisha (Sharp Corporation), Osaka, Japan
Filed Aug. 21, 1974, Ser. No. 499,150
Claims priority, application Japan Feb. 25, 1974
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D26—5 C



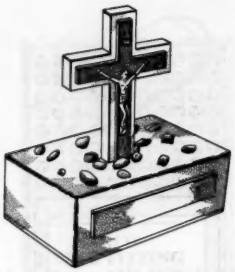
240,137
TELEPRINTER
Paul A. Jenkins, Groton, and Richard C. Schneider, Marlboro, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.
Filed Sept. 16, 1974, Ser. No. 506,138
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5 C

240,138
CASSETTE TAPE RECORDER
Richard Culbertson, Manlius, and Cornelius W. Christie, Fulton, N.Y., assignors to General Electric Company, Syracuse, N.Y.
Filed May 30, 1975, Ser. No. 582,477
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D26—14 B

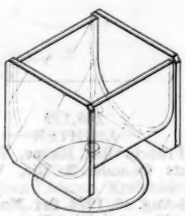


240,139
LIGHTER
Guy Neyret, Francheville, Rhone, France, assignor to Etablissements Genoud & Cie, Venissieux, Rhone, France
Filed Aug. 30, 1974, Ser. No. 502,228
Claims priority, application France Mar. 13, 1974
Term of patent 14 years
Int. Cl. D27—*02*
U.S. Cl. D27—42

240,140
CRUCIFIX
Henry B. Graves III, Miami, Fla.
(101 Antiquera, Coral Gables, Fla. 33134)
Filed June 10, 1974, Ser. No. 478,050
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D29—23 A



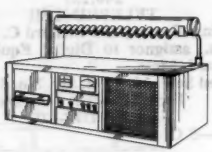
240,141
AQUARIUM OR SIMILAR ARTICLE
Tony Robert, 5701 Southwest Freeway,
Houston, Tex. 77057
Filed Mar. 24, 1975, Ser. No. 561,490
Term of patent 14 years
Int. Cl. D30—*02*
U.S. Cl. D30—6



240,142
TAIL ENGAGED DOG CONTROL HARNESS
John P. Francis, 20 Boston St.,
Haverhill, Mass. 01830
Continuation-in-part of design application Ser. No. 248,778, Apr. 28, 1972, now Patent No. 230,036.
This application Oct. 5, 1973, Ser. No. 404,119
Term of patent 14 years
Int. Cl. D30—*04*
U.S. Cl. D30—38

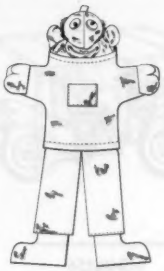
240,143
TAIL ENGAGED DOG CONTROL HARNESS WITH DUAL HAND LEASH
John P. Francis, 20 Boston St.,
Haverhill, Mass. 01830
Continuation-in-part of design application Ser. No. 248,778, Apr. 28, 1972, now Patent No. 230,036.
This application Nov. 8, 1973, Ser. No. 413,901
Term of patent 14 years
Int. Cl. D30—*04*
U.S. Cl. D30—38

240,144
FREEZE DRYER
Douglas S. Fraser, New Paltz, N.Y., assignor to FTS Systems, Inc., Stone Ridge, N.Y.
Filed July 29, 1974, Ser. No. 492,887
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D32—2 C



240,145
MAGNETIC MIXING BAR
Leonard E. Brown and Larry E. Brown, Morton Grove, Ill., assignors to Parkside Industries, Chicago, Ill.
Filed Feb. 24, 1975, Ser. No. 552,383
Term of patent 14 years
Int. Cl. D24—*99*
U.S. Cl. D32—2 C

240,146
PUPPET
Jean Lowenstein, Erdenheim, Pa., and Robert V. Myers, Elgin, Ill., assignors to David C. Cook Publishing Company, Elgin, Ill.
Filed Jan. 10, 1975, Ser. No. 540,285
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—4 R



240,147
PUPPET
Robert V. Myers, Elgin, Ill., and Jean Lowenstein, Erdenheim, Pa., assignors to David C. Cook Publishing Company, Elgin, Ill.
Filed Jan. 10, 1975, Ser. No. 540,212
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—4 R

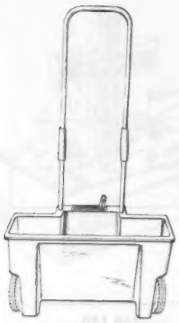
240,148
GAME NET
Fred L. Carbonero, 1623 Kingsmere, Rochester, Mich. 48063
Filed Nov. 20, 1974, Ser. No. 525,343
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 VV

240,149
TOY SAVINGS BANK
Lesta V. Herring, 1911 Ariel Drive, Dallas, Tex. 75232
Filed Apr. 24, 1974, Ser. No. 463,558
Term of patent 14 years
Int. Cl. D31—*00*
U.S. Cl. D34—11 A

240,150
INFLATABLE BOXING GLOVE
Jimmy Kowk Wing Lau, 2–1, Section 2, Shihchuan Road, Panchiao, Taipei Hsien, Taiwan, Republic of China
Filed June 26, 1974, Ser. No. 483,281
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—15 DD

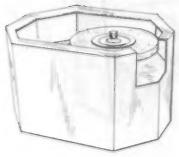
240,151
TOY STAGE
Albert Stubbmann, Franklin Lakes, N.J., assignor to Kohner, Inc., New York, N.Y.
Filed Oct. 7, 1974, Ser. No. 512,570
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 R

240,152
SPREADER FOR FERTILIZER AND OTHER GRANULAR OR POWDERY MATERIAL
Dieter Raffler and Franco Clivio, Ulm, Germany, assignors to Gardena Kress + Kastner GmbH
Filed Apr. 3, 1974, Ser. No. 457,621
Claims priority, application Germany Oct. 8, 1973
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D35—2 R

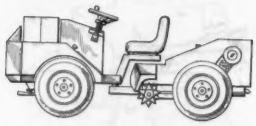


240,153
LAPIDARY APPARATUS FOR PROCESSING STONES
John W. Flaherty, Galesburg, Ill., and Robert C. Ingersoll and William F. Goodrich, Adrian, Mich., assignors to Dick Blick Company
Filed Mar. 17, 1975, Ser. No. 559,263
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D37—1 A

240,154
LAPIDARY APPARATUS FOR PROCESSING STONES
John W. Flaherty, Galesburg, Ill., and Robert C. Ingersoll and William F. Goodrich, Adrian, Mich., assignors to Dick Blick Company
Filed Mar. 17, 1975, Ser. No. 559,264
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D37—1 A



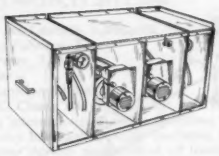
240,155
SELF PROPELLED ARTICULATED LAWN TREATING VEHICLE
John W. Burns and James A. Burns, Olney, Md. (both of 1107 Taft St., Rockville, Md. 20850)
Filed Apr. 4, 1975, Ser. No. 565,087
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D40—1 E



240,156
SHADE FOR A LAMP
Bozidar M. von Serda, 9304 Santa Monica Blvd., Beverly Hills, Calif. 90210
Filed Aug. 26, 1974, Ser. No. 500,324
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—16 D

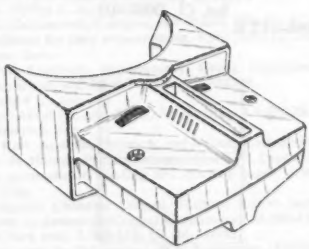
240,157
LIGHT GUARD
Harry M. Dorn, North Miami, Fla. (1133 Broadway, New York, N.Y. 10010)
Filed Nov. 13, 1974, Ser. No. 523,399
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—16 B

240,158
FOAM INSULATION APPLICATION UNIT
Henry Sperber, assignor to Ark-Seal Corporation, Denver, Colo.
Filed Mar. 29, 1974, Ser. No. 455,983
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D55—1 R

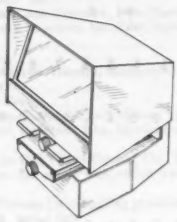


240,159
CLOCK RADIO
Kunio Hoshino, Kadoma, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Kadoma, Osaka, Japan
Filed May 9, 1974, Ser. No. 468,511
Claims priority, application Japan Nov. 12, 1973
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D56—4 B

240,160
APERTURE CARD VIEWER
Thomas C. Laughon, Columbia, Md., and James H. Sias, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Mar. 14, 1974, Ser. No. 451,242
Term of patent 14 years
Int. Cl. D16—*02*
U.S. Cl. D16—15



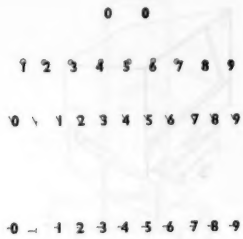
240,161
MICROFICHE VIEWER
Peter Joseph Hall, Willowdale, Ontario, Canada, assignor to Microfilm Recording Co. Ltd.
Filed July 31, 1974, Ser. No. 493,408
Term of patent 14 years
Int. Cl. D16—*02*
U.S. Cl. D16—14



240,162
DIAZO DEVELOPER APPARATUS
Paul Matwey, Binghamton, N.Y., assignor to GAF Corporation, New York, N.Y.
Filed Jan. 17, 1975, Ser. No. 541,924
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D16—31

240,163
FONT OF LETTERS AND FIGURES
Robert N. Craven, Valley Cottage, N.Y., assignor to The Ealing Corporation, Cambridge, Mass.
Filed Feb. 28, 1973, Ser. No. 337,285
Term of patent 14 years
Int. Cl. D18—*03*
U.S. Cl. D64—12 B

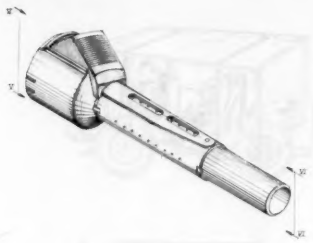
240,164
FONT OF NUMBERS
Marius Gagnadre, 8304 De Gaspe St., Montreal, Quebec, H2P 2K1, Canada
Filed Feb. 27, 1975, Ser. No. 512,057
Term of patent 14 years
Int. Cl. D18—*03*
U.S. Cl. D64—12 B



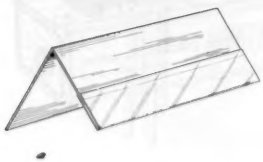
240,165
SOAP BAR
Tedd Theodore Thomas, New Canaan, Conn., assignor to Herbert S. Sylvester, Colgate-Palmolive Company, New York, N.Y.
Filed May 16, 1974, Ser. No. 470,455
Term of patent 14 years
Int. Cl. D28—*02*
U.S. Cl. D73—1 B

240,166
MEDICAL ELECTRODE
James Vernon Cartmell and Edwin Charles Beck, Dayton, Ohio, assignors to NDM Corporation
Filed Jan. 13, 1975, Ser. No. 540,652
Term of patent 14 years
Int. Cl. D24—*01, 99*
U.S. Cl. D83—1 F

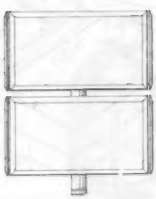
240,167
CURLING IRON ATTACHMENT
Joseph A. Rinaldi, Oradell, N.J., assignor to The Gillette Company, Boston, Mass.
Filed Dec. 16, 1974, Ser. No. 533,207
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D86—10 E



240,168
COMBINATION CARD AND VIEWER
James C. Brettman, 2770 NE. 6th St., and Mary Lynne Lauson, 777 S. Federal Highway, both of Pompano Beach, Fla. 33062
Filed Jan. 28, 1974, Ser. No. 436,991
Term of patent 14 years
Int. Cl. D20—*03*
U.S. Cl. D96—12 F



240,169
SIGN STRUCTURE OR THE LIKE
Mike Summey, 514 Rhododendron Ave., Black Mountain, N.C. 28711
Filed Feb. 11, 1974, Ser. No. 440,954
Term of patent 14 years
Int. Cl. D20—*03*
U.S. Cl. D96—12 R



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 1ST DAY OF JUNE, 1976

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A.M. Industries: *See—*
Cloud, Robert H.; and Hopton, Edward J., 3,959,892.

A/S Hydraulik Brattvaag: *See—*
Naas, Erling, 3,960,340.

Aagaard, Karl Lund. Method and apparatus for purifying and separating bee glue. 3,960,329, Cl. 241-23.000.

AB Bofors: *See—*
Gustafsson, Jan Kenneth, 3,960,010.

AB Gustavsbergs Fabriker: *See—*
Nordgren, Peter, 3,959,829.

AB Inventing: *See—*
Wallsten, Hans Ivar, 3,960,386.

Abbas, Shakir A.; Chang, Chi S.; Freeman, Leo B., Jr.; and Knepper, Ronald W., to International Business Machines Corporation. Semiconductor device having electrically insulating barriers for surface leakage sensitive devices and method of forming. 3,961,355, Cl. 357-49.000.

Abbott Laboratories: *See—*
Bujan, Albert Frank, 3,960,149.

Abbuhl, Hermann; and Tanner, Hans, to Hydrel A.G.; and W. Schneeberger AG. Series roll body conveyance. 3,960,413, Cl. 308-3.00A.

Abe, Michio, to Tokai TRW & Co. Limited. Method for producing a core form to be employed in the molding of a ball joint bearing. 3,959,872, Cl. 29-527.400.

Abele, Rolf, to Siemens Aktiengesellschaft. Dry-reed contact construction. 3,961,148, Cl. 200-268.000.

Abernathy, David D.; Adams, Herbert D.; Gilbertson, Warren L.; Leonard, Isaac E., III; and Silvia, Denis A., to United States of America, Navy. Variable geometry warhead. 3,960,085, Cl. 102-67.000.

Abney, Dave L.; Williams, Robert C.; and Gilbert, Horace E., to Dresser Industries, Inc. Reverse acting lock open crossover valve. 3,960,366, Cl. 251-341.000.

Aboaf, Joseph A.; Broadie, Robert W.; Hull, Edward M.; and Pogge, H. Bernhard, to International Business Machines Corporation. High power semiconductor device. 3,961,353, Cl. 357-34.000.

Aboutboul, Henri A.; Kirch, William; and Krekeler, Jerome H., to National Petro Chemicals Corporation. Olefin polymerization process. 3,960,826, Cl. 526-103.000.

Abrams, Richard L.; and Chester, Arthur N., to Hughes Aircraft Company. Waveguide gas laser with wavelength selective guide. 3,961,283, Cl. 331-94.50C.

Abriany, Raymond R. Catalytic muffler. 3,960,509, Cl. 23-288.00F.

Acevedo, Ignacio. Flush valve and overflow pipe assembly for a toilet tank. 3,959,828, Cl. 4-57.00P.

ACF Industries, Incorporated: *See—*
Plympton, Michael R., 3,960,168.

Acme Highway Products Corporation: *See—*
Kerschner, James J., 3,960,462.

Acord, William A., to Beckman Instruments, Inc. Chemical analyzer with automatic calibration. 3,960,497, Cl. 23-253.00R.

Acurex Corporation: *See—*
Sweet, John R., II; and Chan, Kingsley, 3,960,293.

Adahan, Carmeli, to Singer Company, The. Combination rotary paper cutter and logo printer. 3,960,080, Cl. 101-291.000.

Adams, Herbert D.: *See—*
Abernathy, David D.; Adams, Herbert D.; Gilbertson, Warren L.; Leonard, Isaac E., III; and Silvia, Denis A., 3,960,085.

Adams, John H. Anchor bolt holder. 3,960,356, Cl. 249-205.000.

Adams, Phillip: *See—*
Merianos, John J.; and Adams, Phillip, 3,960,538.

Addressograph Multigraph Corporation: *See—*
Griesmer, Jerome J., 3,960,556.
Stevko, Phillip J., Jr., 3,960,109.

Adler, Karl; Ducommun, Georges; and Wantz, Charles A., to Biviator S.A. Oscillator for time measurement. 3,961,209, Cl. 310-6.000.

Adler, Klaus: *See—*
Heichele, Friedrich; Vojtechovsky, Georg; Hollenbach, Georg; Adler, Klaus; and Bauer, Johann, 3,960,986.

Adler, Stanford L.: *See—*
Gordon, Abraham; and Adler, Stanford L., 3,960,020.

Adolphi, Heinrich: *See—*
Keihs, Karl; Adolphi, Heinrich; and Huber, Rolf, 3,960,885.

Aebi, Otto, to Hermes Precisa International S.A. Typewriter mechanism for automatically loading and ejecting paper. 3,960,258, Cl. 197-127.00R.

Agarwal, Jagdish Chandra; Giberti, Richard Andre; and Petrovic, Louis John, to Kennecott Copper Corporation. Method for removal of sulfur from coal. 3,960,513, Cl. 44-1.00R.

Agence Nationale de Valorisation de la Recherche (ANVAR): *See—*
Baulard-Cogan, Raymond Gerard, 3,959,919.

Ahlgren, Erick L.; McMorris, Arthur H.; Miille, Jerry L.; and Schweppe, Joseph L., to Houston Engineering Research Corporation. Automatic label-printing apparatus. 3,960,072, Cl. 101-35.000.

Ahrens, Hanns; Rufer, Clemens; Biere, Helmut; Schroder, Eberhard; Losert, Wolfgang; Loge, Olaf; and Schillinger, Ekkehard, to Schering Aktiengesellschaft. 1,2-Biguanides. 3,960,949, Cl. 260-564.00B.

Air Products and Chemicals, Inc.: *See—*
Wyatt, Kenneth, 3,960,717.

Airwick Industries, Inc.: *See—*
Rabussier, Bernard; and Mandon, Jean-Pierre, 3,961,040.

Aisenberg, Sol, to Space Sciences, Inc. Film deposition. 3,961,103, Cl. 427-39.000.

Aizawa, Hiroshi: *See—*
Hosoe, Kazuya; Aizawa, Hiroshi; Matsumoto, Seiichi; and Yokota, Hideo, 3,961,178.

Ajinomoto Co., Inc.: *See—*
Enei, Hitoshi; Sato, Katsuaki; and Hirose, Yoshio, 3,960,660.
Enei, Hitoshi; Sato, Katsuaki; Ishii, Morikatsu; and Hirose, Yoshio, 3,960,661.

Akiyama, Kazuhiro, to Fuji Photo Optical Co., Ltd. Automatic exposure control means for single-lens reflex camera. 3,961,339, Cl. 354-29.000.

Akiyama, Taichiro. Process for preparing granular porous silicone rubbers. 3,960,786, Cl. 260-2.50S.

Aktiebolaget ASEA-ATOM: *See—*
Isaksson, Conny; Nordin, Lars-Erik; Olsson, Curt; and Sahlin, Thorbjorn, 3,960,263.

Aktiebolaget M. Anderssons Isolering: *See—*
Andersson, Frans Gunnar Seved, 3,960,180.

Aktiebolaget Piab: *See—*
Tell, Peter Hans, 3,959,864.

A.G. fur industrielle Elektronik AGIE Losone b. Locarno: *See—*
Ullmann, Werner; Derighetti, Renato; and Gagliati, Umberto, 3,961,270.

Albrecht, Donald. Traction belt. 3,960,146, Cl. 128-75.000.

Albright & Wilson Limited: *See—*
Walker, Ralph Lawrence; and Stockdale, John Richard, 3,960,611.

Alco Standard Corporation: *See—*
Smith, Robert D., 3,960,006.

Alder, Hanspeter, to Swiss Aluminium Ltd. Electrolysis of a molten charge using incomsumable electrodes. 3,960,678, Cl. 204-67.000.

Aldred, Edward John, to Ransomes Sims & Jefferies Limited. Speed control mechanisms for vehicles. 3,960,233, Cl. 180-77.00R.

Alexander, Robert: *See—*
Parker, Alan James; Waghorne, Winfield Earle; Giles, Dion Ewing; Sharp, John Howard; Alexander, Robert; and Muir, David Michael, 3,961,028.

Alexeev, Viktor Ivanovich; Emelyanov, Ivan Yakovlevich; Ivanov, Vladimir Maximovich; Konstantinov, Leonard Vasilievich; Lysikov, Boris Vasilievich; Postnikov, Viktor Viktorovich; and Rybakov, Jury Viktorovich. Miniature ionization chamber. 3,961,196, Cl. 250-385.000.

Alfa-Laval AB: *See—*
Dahlberg, Bengt Ingmar, 3,960,318.

Alfred Herbert Limited: *See—*
Gaskell, Colin Simister; and O'Brien, Rory Morgan, 3,961,256.

Allen, David. Roof truss spacer. 3,959,945, Cl. 52-690.000.

Allen, John Clarence, Jr. Automatic spot sprayer. 3,959,924, Cl. 47-1.430.

Allen, Paul T., to Mobil Oil Corporation. Separation of isomers. 3,960,520, Cl. 55-59.000.

Allen, Robert J.: *See—*
Petrow, Henry G.; and Allen, Robert J., 3,960,989.

Allen, Samuel B. Method for producing large rigid foam panels. 3,960,998, Cl. 264-45.100.

Alley, David W., to Pravel & Wilson; and Alley, David W., part interest to each. Tongue toothbrush. 3,959,842, Cl. 15-167.00R.

Allied Chemical Corporation: *See—*
Kavesh, Sheldon, 3,960,200.
Vitek, Richard K., 3,961,024.

Allis-Chalmers Corporation: *See—*
Shy, James L.; and Bliemeister, Robert M., 3,959,890.
Spooner, Ronald E.; and Downing, Terry R., 3,960,286.
Waterman, Michael W.; and Foster, Samuel L., 3,961,246.

Allred, Victor D., to Marathon Oil Company. Vapor phase water process for retorting oil shale. 3,960,702, Cl. 208-11.00R.

Alonas, Kay, to Teletype Corporation. Keying contact assembly. 3,961,147, Cl. 200-159.00B.

Alpine Designs, Inc.: *See—*
Hunt, Harry, 3,959,834.

Alps Motorola, Inc.: *See—*
Takagi, Susumu, 3,961,373.

Altainer Incorporated: *See—*
Ropiequet, Richard L., 3,961,000.

Aluminum Company of America: *See—*
Ryan, James R., 3,960,523.

Alvarez, Cesar E., Jr., to Teletype Corporation. Multiple phase clock generator. 3,961,269, Cl. 328-62.000.

Alvarez, Francisco Sanchez, to Syntex Corporation. 2-(6'-methoxynaphth-2'yl) propionaldoxime and 5'-halo derivatives thereof. 3,960,957, Cl. 260-566.00A.

Alza Corporation: *See—*
Hussain, Anwar A.; Higuchi, Takeru; and Shell, John W., 3,960,150.

Amchem Products, Inc.: *See—*
Newhall, William F., 3,960,539.
Steinbrecher, Lester; and Hall, Wilbur S., 3,960,610.

Amerace Corporation: *See—*
Cirule, Fred M.; and Preziosi, Joseph R., 3,960,395.
Wyman, Carl W.; and Andersen, Charles E., 3,959,869.

American Can Company: *See—*
Dobbins, Thomas Edward, 3,960,315.
Feinberg, Jacob Howard, 3,960,684.
Rush, John E., 3,960,073.

American Chain & Cable Company, Inc.: *See—*
Henig, Seymour, 3,960,262.

American Cyanamid Company: *See—*
Augurt, Thomas Anthony; Rosensaft, Michael Norman; and Perciaccante, Vincent Anthony, 3,960,152.
Beachem, Michael Thomas; and Nichols, Mary Ellen, 3,960,755.
Blank, Werner Josef, 3,960,983.
Calbo, Leonard Joseph, Jr., 3,960,688.
Cerini, Costantino Peter, 3,961,046.
Sonnino, Mario, 3,959,947.
Ueno, Eichiro; Kawasaki, Hideo; and Shigita, Syozo, 3,959,836.

American Frozen Foods Corporation: *See—*
Zukerman, Harold W., 3,961,087.

American Hoist & Derrick Company: *See—*
Carpenter, Emerl R., 3,960,284.

American Hospital Supply Corporation: *See—*
Choksi, Pradip V.; and Steidley, Roy B., 3,960,002.

American Multi-Lert Corporation: *See—*
Hartkorn, Albert W., 3,961,323.

American Optical Corporation: *See—*
Davis, John King; and Fernald, Henry Grant, 3,960,442.
Woodcock, Richard Forrest, 3,960,754.

American Videonetics Corporation: *See—*
Furst, Marcel, 3,960,342.

AMF Incorporated: *See—*
Asberry, James Robert, 3,961,319.

AMP Incorporated: *See—*
Bunnell, Edward Dennman; Fleischhacker, James Earl; and Tennant, Robert John, 3,960,430.
Hollyday, Robert David, 3,961,294.
Hollyday, Robert David; and Bradbery, Jack Leo, 3,961,295.
Soes, Lucas, 3,960,434.
Weisenburger, Lawrence Paul, 3,960,423.
Weisenburger, Lawrence Paul, 3,960,424.

Analog Devices, Inc.: *See—*
Craven, Robert B., 3,961,326.

Andersen, Charles E.: *See—*
Wyman, Carl W.; and Andersen, Charles E., 3,959,869.

Anderson, Frank R.: *See—*
Stephens, James B.; and Anderson, Frank R., 3,960,297.

Anderson, Glenn W.: *See—*
Hutchison, Stanley O.; and Anderson, Glenn W., 3,960,014.

Anderson, Harold E.; and Kiner, Gerald T., to McCulloch Corporation. Capacitor discharge ignition system. 3,960,128, Cl. 123-148.00E.

Anderson, Luzon L. Apparatus for preparing ice. 3,959,981, Cl. 62-135.000.

Anderson, Ralph A.: *See—*
Thompson, Harold R.; and Anderson, Ralph A., 3,960,343.

Anderson, Thomas P., to Microseal Corporation. Film record card. 3,959,907, Cl. 40-159.000.

Andersson, Frans Gunnar Seved, to Aktiebolaget M. Anderssons Isolering. Protection cover for pipe bends. 3,960,180, Cl. 138-110.000.

Ando, Yujiro, to Canon Kabushiki Kaisha. Image formation method. 3,961,192, Cl. 250-315.00R.

Andrews, Ann; and Andrews, Peter. Hair rollers. 3,960,157, Cl. 132-40.000.

Andrews, John S., to H. H. Robertson Company. Particle separating apparatus. 3,960,526, Cl. 55-227.000.

Andrews, Lawrence F. Spring-stressed orthodontic bracket. 3,959,880, Cl. 32-14.00A.

Andrews, Peter: *See—*
Andrews, Ann; and Andrews, Peter, 3,960,157.

Angilletta, Domenick J. Solar heater and thermal barrier. 3,960,135, Cl. 126-270.000.

Anheuser-Busch, Incorporated: *See—*
Teng, James; and Stubits, Marcella C., 3,960,514.

ANPA Research Institute: *See—*
Navi, Menashe, 3,960,291.

Anstey, Nigel A., to Scitex Corporation Ltd. Method of forming color graphic displays from input data. 3,961,306, Cl. 340-15.5DS.

Anthony, William H.; and Popplewell, James M., to Swiss Aluminium Ltd. Process for providing heat transfer with resistance to erosion-corrosion in aqueous environment. 3,960,208, Cl. 165-1.000.

Antivols Simplex S.A.: *See—*
Thirion, Andre, 3,959,996.

Antonov, Asparuh Mihailov: *See—*
Balevski, Anguel Tonchev; Nikolov, Ivan Dimov; Antonov, Asparuh Mihailov; and Semerdjiev, Stefan Georgiev, 3,960,996.

Antos, George J.; Hayes, John C.; and Pollitzer, Ernest L., to Universal Oil Products Company. Hydrocarbon conversion with an acidic multimetallic catalytic composite. 3,960,711, Cl. 208-139.000.

Anumin Pty. Limited: *See—*
Parker, Alan James; Waghorne, Winfield Earle; Giles, Dion Ewing; Sharp, John Howard; Alexander, Robert; and Muir, David Michael, 3,961,028.

Anzai, Makoto: *See—*
Aono, Shigeo; and Anzai, Makoto, 3,960,120.

Aoki Electric Industrial Co., Ltd.: *See—*
Otagoshi, Hitoshi, 3,961,175.

Aoki, Hideo: *See—*
Yasui, Hiroshi; Kyono, Iwao; Aoki, Hideo; and Manabe, Haruo, 3,961,031.

Aono, Shigeo; and Anzai, Makoto, to Nisan Motor Co., Ltd. Electronic fuel injection control circuit for an internal combustion engine. 3,960,120, Cl. 123-32.0EA.

Applied Science Laboratories, Inc.: *See—*
Kruppa, Richard F.; and Coleman, Arthur Edward, 3,960,521.

Aprato, Armando: *See—*
Bisson, Flavio; and Aprato, Armando, 3,960,255.

Arai, Mikio: *See—*
Nishimura, Kenji; Arai, Mikio; Sasahara, Kunihiro; and Nitanai, Takashi, 3,961,041.

Aramaki, Masaharu: *See—*
Nomura, Etsuji; Aramaki, Masaharu; and Nishimura, Yuji, 3,960,681.

Archambault, Jean. Dishwashing machine and rotary sprayer therefor. 3,960,328, Cl. 239-264.000.

Archibald, Robert W. Dinghy with mast well. 3,959,837, Cl. 9-2.00R.

Arend, Raymond J.: *See—*
Plattner, Robert F.; Arend, Raymond J.; and Verberkmoes, John A., 3,960,352.

Arias, Anibal Aguirre, to Escalesilla Tresaes Ltd. Furniture foldable structure. 3,960,241, Cl. 182-33.300.

Ariga, Junichi: *See—*
Ohigashi, Tugio; and Ariga, Junichi, 3,961,265.

Arisaka, Kunio, to Copal Company Limited. Opening and closing means for electrically controlled shutters. 3,961,345, Cl. 354-234.000.

Arlt, Dieter; and Bremen, Josef, to Bayer Aktiengesellschaft. Process for the preparation of isopropenyl isocyanate. 3,960,915, Cl. 260-453.00P.

Armco Steel Corporation: *See—*
Evans, James D.; and Long, William R., Jr., 3,960,616.

Armstrong, David J.: *See—*
Besand, Roy T.; Carey, Paul L.; and Armstrong, David J., 3,961,088.

Artos Engineering Company: *See—*
Gudmestad, Ragnar; and Sandblom, Sven O., 3,960,040.

Artur Fischer: *See—*
Linser, Jorg, 3,960,166.

Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Ibata, Jyoji; Kobayashi, Hidehiko; Toyomoto, Kazuo; Suzuoki, Kazuhiro; Hayashi, Yoshio; and Kurihara, Masakazu, 3,960,572.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
Shono, Tetsuji, 3,961,343.

Asai, Komei: *See—*
Moriyama, Akio; Fukai, Masakazu; and Asai, Komei, 3,960,750.

Asai, Yasuhiro: *See—*
Tabuchi, Muneharu; Bando, Shosen; Tabei, Tadashi; and Asai, Yasuhiro, 3,961,158.

Asberry, James Robert, to AMF Incorporated. Ground circuit monitor. 3,961,319, Cl. 340-255.000.

Asher, Delman R.: *See—*
Raley, Charles F., Jr.; and Asher, Delman R., 3,960,770.

Aspro, Incorporated: *See—*
Eddy, William C., 3,961,309.

Association for Pharmacologic Research, Inc.: *See—*
Innerfield, Irving, 3,960,669.

Astra Lakemedal Aktiebolag: *See—*
Fuxe, Kjell Gunnar, 3,961,060.

Atchley, Fenimore Edward; and Gilliam, Betty Lou. Grass-clearing device for lawn-sprinkler heads. 3,960,218, Cl. 172-13.000.

Athens Stove Works, Inc.: *See—*
Biddle, William P.; and Tacker, John J., 3,959,866.

Atlantic Richfield Company: *See—*
Russell, Donald H.; and Lenton, R. Warren, 3,960,813.
Striegler, John Howard; and Howell, Eddie Paul, 3,960,213.
Striegler, John Howard; and Howell, Eddie Paul, 3,960,214.

Atlas Copco Aktiebolag: *See—*
Noren, Carl Anders, 3,960,407.

Ato Chimie: *See—*
Potin, Philippe; and Biensan, Michel, 3,960,846.

Atom Chemical Paint Co., Ltd.: *See—*
Nishiumi, Yoshio; and Nagasaka, Yukio, 3,960,326.

Auburn Research Foundation: *See—*
Nasir, Syed Shahid; and Wilken, Leon Otto, Jr., 3,961,004.

Audero, Miguel Angel: *See—*
Varotto, Conrado F.; Audero, Miguel Angel; Vasallo, Daniel I.; Pascual, Roberto; and Ruffo, Hector J., 3,960,548.

Augurt, Thomas Anthony; Rosensaft, Michael Norman; and Perciaccante, Vincent Anthony, to American Cyanamid Company. Surgical sutures of unsymmetrically substituted 1,4-dioxane-2,5-diones. 3,960,152, Cl. 128-335.500.

Augustine, Douglas R.: *See—*
Barnett, Charles W. H.; Lucey, George K., Jr.; and Augustine, Douglas R., 3,960,000.

Aungst, Jack D., to Rockwell International Corporation. Visually alignable sensor wand which excludes unwanted light from a sensor system. 3,961,198, Cl. 250-566.000.

Ausnit, Steven. Interlocking separable fastener. 3,959,856, Cl. 24-201.00C.

Austin, Thomas Howard: *See—*
Cuscurida, Michael; and Austin, Thomas Howard, 3,960,788.

Automated Building Components, Inc.: *See—*
Leutwyler, Roy B., 3,960,353.

Automobiles Peugeot: *See—*
Chometon, Alain; and Boquet, Georges, 3,960,031.

Avakian, Souren; and Seneca, Harry, to Centaur Chemical Co. Multimedia petri dish. 3,960,658, Cl. 195-103.50R.

Avins, Jack; and Yorkanis, Bernard Joseph, to RCA Corporation. Gain control arrangement useful in a television signal processing system. 3,961,361, Cl. 358-27.000.

Aylett, Frank Henry, to Vickers Limited. Printing with blanket having recessed portion. 3,960,077, Cl. 101-142.000.

Aziende Colori Nazionali Affini ACNA S.p.A.: *See—*
Ribaldone, Giuseppe; Borsotti, Giampiero; and Gonzati, Franco, 3,960,866.

Azuma, Tosio; and Yonekawa, Hisashi, to Bridgestone Tire Company Limited. Apparatus for and method of conveying and handling tire bead wires. 3,960,260, Cl. 198-19.000.

Baba, Yoshio, to Director-General of the Agency of Industrial Science and Technology. Process for the desulfurization of light oils. 3,960,683, Cl. 204-158.00R.

Babcock, Henry Nash, to Construction Products Research, Inc. Composition and method for inhibiting curing shrinkage in organic plastic systems. 3,960,785, Cl. 260-2.50R.

Babler, Egon S., to Teletype Corporation. Elastomeric mounting mechanisms. 3,960,075, Cl. 101-93.480.

Backus Devices, Incorporated: *See—*
Backus, Harold Adams, 3,960,121.

Backus, Harold Adams, to Backus Devices, Incorporated. Engine combustion system. 3,960,121, Cl. 123-34.00A.

Badische Anilin- & Soda-Fabrik Aktiengesellschaft: *See—*
Keihs, Karl; Adolphi, Heinrich; and Huber, Rolf, 3,960,885.
Rohr, Wolfgang; and Fischer, Adolf, 3,960,919.

Baget, Jean, to Rhone-Poulenc Industries. Hydroxy and ether containing phenothiazine derivatives. 3,961,055, Cl. 424-247.000.

Bahr, William J. Target and air actuated projectors. 3,960,378, Cl. 273-85.00H.

Bailey, Donald L. Syringe device with means for removing contaminates when drawing blood sample. 3,960,139, Cl. 128-2.00F.

Bailey Meter Company: *See—*
Ross, David F.; and Pocock, Robert E., 3,960,500.

Bailey, William R.; Krumm, Stephen H.; and Marach, David R., to Underwriters Safety Device Company. Cartridge fuse clip with rejection means. 3,960,435, Cl. 339-186.00R.

Baisch, Theodor; Deininger, Kurt; Strobel, Joseph R.; and Trumpp, Alfred, to Eastman Kodak Company. Dual field viewfinder. 3,961,344, Cl. 354-222.000.

Baker, Allister L.; and Kooi, J. Peter E., to Keuffel & Esser Company. Precise indexing detent. 3,959,888, Cl. 33-282.000.

Baker, Charles T., to Vermont Marble Company. Easy-open ecology crown cap. 3,960,287, Cl. 215-253.000.

Baker, Don R.; Walker, Francis H.; and Letchworth, Peter E., to Stauffer Chemical Company. N-cyanomethyl-N-methyl-3,5-dimethylbenzamide. 3,960,922, Cl. 260-465.00D.

Bakewell, Henry P., Jr., to United States of America, Navy. Decoupled hydrophone with reduced response to vibration and stress concentration. 3,961,304, Cl. 340-7.00R.

Bakke, Even; Witte, Michael; and Mehta, Manankumar S., to U.S. Filter Corporation. Electrostatically enhanced removal of sulfur dioxide from gaseous carriers. 3,960,687, Cl. 204-164.000.

Balassiano, Max. Flexible double ball-point pen. 3,960,455, Cl. 401-209.000.

Balevski, Anguel Tonchev; Nikolov, Ivan Dimov; Antonov, Asparuh Mihailov; and Semerdjiev, Stefan Georgiev, to Institut po Metaloznanie i Technologia na Metalite. Method of injection molding a thermoplastic article having a cellular core and integral skin involving use of reclaimed material. 3,960,996, Cl. 264-37.000.

Balko, Edward N.: *See—*
Bortak, John J.; Balko, Edward N.; Schweickart, Albert J.; and Collins, Stephen M., 3,960,699.

Ball, Frank J.; Braddon, David V.; and Stryker, Lynden J., to Westvaco Corporation. Low porosity cement and process for producing same. 3,960,582, Cl. 106-90.000.

Ballantyne, Joseph M.; Tang, Chung L.; Rhodes, Lawrence Bryce; Turner, John J.; and Yang, Ji Liang, to Cornwell Research Foundation, Inc. Scanning electron microscope fabrication of optical gratings. 3,961,102, Cl. 427-43.000.

Baltare, Gunnar: *See—*
Gee, Thomas A.; Jacobs, Gerald L.; and Baltare, Gunnar, 3,961,215.

Bando, Shosen: *See—*
Tabuchi, Muneharu; Bando, Shosen; Tabei, Tadashi; and Asai, Yasuhiro, 3,961,158.

Baranova, Rimma Bronislavovna; Lazarev, Vladimir Ilich; Mironov, Nikolai Petrovich; Pinaev, Viktor Alexandrovich; Bugaenko, Lenar Timofeevich; Kalyazin, Evgeny Petrovich; Panferova, Alexandra Timofeevna; Byakov, Vsevolod Mikhailovich; Nikeshichev, Jury Nikolaevich; and Petryaev, Petrovich Evgeny, to Nikeshichev, Jury Nikolaevick; and Petryoev, Evgeny Petrovich. Method of processing waste gases containing sulphurous-acid anhydride. 3,960,682, Cl. 204-157.10H.

Bare, Thomas M.; and Shu, John T., to Richardson-Merrell Inc. 1-Oxo-1H-2-benzothiopyran-3-carboxylic acid derivatives. 3,960,892, Cl. 260-327.0TH.

Barker International, Inc.: *See—*
Crane, Edward J., 3,959,850.

Barna, Janos, to Novex Talalmanyfejleszto es Ertekesito Kulkereskedelmi Rt. Process for the separation of natural water-soluble aluminum hydrosilicate organo-complexes. 3,960,724, Cl. 210-49.000.

Barnett, Charles W. H.; Lucey, George K., Jr.; and Augustine, Douglas R., to United States of America, Army. Flight simulator for missiles. 3,960,000, Cl. 73-15.400.

Barrett, Harrison H., to Raytheon Company. High intensity radiation imaging system. 3,961,188, Cl. 250-303.000.

Barrett, Harrison H.: *See—*
Stoner, William W.; Wilson, David T.; and Barrett, Harrison H., 3,961,191.

Barringer, Anthony Rene, to Barringer Research Limited. Remote sensing of marine hydrocarbon seeps. 3,961,187, Cl. 250-301.000.

Barringer Research Limited: *See—*
Barringer, Anthony Rene, 3,961,187.

Barrio, Jorge R.: *See—*
Secrist, John A., III; Barrio, Jorge R.; Leonard, Nelson J.; and Weber, Gregorio, 3,960,840.

Barry Wright Corporation: *See—*
Frochaux, Alain; and Salerno, Charles M., 3,960,239.

Barton, Lucian Anthony, to RCA Corporation. Process for improved development of electron-beam-sensitive resist films. 3,961,101, Cl. 427-43.000.

BASF Aktiengesellschaft: *See—*
Daubach, Ewald; Saukel, Heinz; and Von Rambach, Leonhard, 3,960,486.
Fuchs, Werner; Platz, Rolf; and Vogt, Volker, 3,960,916.
Hagen, Helmut; and Niemeyer, Juergen, 3,960,862.
Pasedach, Heinrich; and Friederang, Albrecht, 3,960,970.
Sander, Bruno; Berbner, Heinz; and Hoffmann, Manfred, 3,960,794.

BASF Wyandotte Corporation: *See—*
Bortak, John J.; Balko, Edward N.; Schweickart, Albert J.; and Collins, Stephen M., 3,960,699.
Davis, Pauls; Vogt, Herwart C; and Deck, Charles F., 3,960,822.
Vogt, Herwart C.; Deck, Charles F.; and Davis, Pauls, 3,960,821.

Basili, Pietro: *See—*
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Bastian-Blessing: *See—*
Plattner, Robert F.; Arend, Raymond J.; and Verberkmoes, John A., 3,960,352.

Batesville Casket Company: *See—*
Stein, Joseph A., Jr.; and Wettering, Carl A., 3,959,859.

Battersby, John; and Forbes, Eric Simon, to British Petroleum Company Limited, The. Gasoline composition. 3,960,965, Cl. 260-584.00R.

Bauer, Johann: *See—*
Heichele, Friedrich; Vojtechovsky, Georg; Hollenbach, Georg; Adler, Klaus; and Bauer, Johann, 3,960,986.

Baulard-Cogan, Raymond Gerard, to Agence Nationale de Valorisation de la Recherche (ANVAR). Animated objects such as dolls, figured personages and the like. 3,959,919, Cl. 46-135.00R.

Bauman, Robert Andrew, to Colgate-Palmolive Company. Ketoquaternary compositions. 3,961,074, Cl. 424-54.000.

Bauman, Robert Andrew, to Colgate-Palmolive Company. Etherlinked quaternary ammonium compositions. 3,961,075, Cl. 424-54.000.

Baumann, Gerald W.; Fraser, Harvey R., Jr.; and Hauke, Francis E., to International Business Machines Corporation. Rotating head apparatus having a protruding diameter headwheel which supports a protruding flying head. 3,961,369, Cl. 360-84.000.

Baumann, Hans D. Low torque and low noise butterfly valve disc. 3,960,177, Cl. 137-625.310.

Baur, Charles B.; and Schultz, Roland P. Article for covering various pipefittings. 3,960,181, Cl. 138-178.000.

Baxter, George I.; Rolla, Clarence P.; and Holland, Charles L., to General Dynamics Corporation. Refrigerated hopper equipment for automatic riveting machines. 3,960,206, Cl. 165-61.000.

Bayer Aktiengesellschaft: *See—*
Arlt, Dieter; and Bremen, Josef, 3,960,915.
Burger, Alex; Kaiser, Hermann; and Ludovici, Werner, 3,960,761.
Darsow, Gerhard; Schiller, Paul; Reese, Eckart; Bottenbruch, Ludwig; Binsack, Rudolph; Vernaleken, Hugo; and Wank, Joachim, 3,960,815.
Hippolyte JUY, Lucien Charles; and Suckfull, Fritz, 3,960,831.
Knickel, Birger; Keifer, Siegfried; Perrey, Hermann; Rudolph, Hans; Rosenkranz, Hans Jurgen; and Rudisch, Reinhold, 3,960,590.
Kramer, Wolfgang; Draber, Wilfried; Hammann, Ingeborg; and Scheinpflug, Hans, 3,961,061.
Kroebel, Reinhard; and Meyer, Alfred, 3,960,762.
Linhart, Karl; and Schmitz, Reinold, 3,960,903.
Schmitzer, Willi, 3,960,506.

Vernaleken, Hugo; Bottenbruch, Ludwig; Emmer, Gerhard; and Hucks, Uwe, 3,960,968.
Witte, Josef; Theisen, Dieter; Roos, Ernst; and Nutzel, Karl, 3,960,758.
Wollweber, Hartmund; Enders, Edgar; and Stendel, Wilhelm, 3,960,890.

Bayer, Ernst; and Mutter, Manfred, to Hoechst Aktiengesellschaft. Polyalkylene glycols used for the preparation of peptides. 3,960,830, Cl. 260-112.50R.

BBC Brown Boveri & Company Limited: *See—*
Meylan, Pierre, 3,959,973.

Beach, Edmund E.: *See—*
Briggs, Glenn E.; Beach, Edmund E.; and Chase, Walter P., 3,961,228.

Beach, Shirley, to Phillips Cables Limited. Composition for filling cables. 3,961,128, Cl. 174-23.00C.

Beachem, Michael Thomas; and Nichols, Mary Ellen, to American Cyanamid Company. Detecting compositions and method of using same. 3,960,755, Cl. 252-301.160.

Beacon, Robert G., to Ellcon-National, Inc. Empty-load brake with lading controlled reservoir. 3,960,411, Cl. 303-23.00R.

Beatty, Bobby D.; Daniel, Russell D.; Humerickhouse, Billy J.; and Norris, Gary G., to United States of America, Navy. Smoke and illumination signal. 3,960,087, Cl. 102-90.000.

Bechteler, Martin; Stock, Rolf; and Welsch, Wolfgang, to Siemens Aktiengesellschaft. Electron optical system with a magnetic focusing and electromagnetic deflection system of unit design. 3,961,219, Cl. 313-389.000.

Beck, Siegfried; Brack, Karl; and Gansauge, Peter, to International Business Machines Corporation. Method of implantation of boron ions utilizing a boron oxide ion source. 3,960,605, Cl. 148-1.500.

Becker, James H.; and Wysocki, Joseph J., to Xerox Corporation. Texture transformations in optically negative liquid crystals. 3,960,439, Cl. 350-160.0LC.

Becker, Kurt, to Hermann Heye. Apparatus for simultaneously transferring a plurality of articles from one conveyor to another. 3,960,266, Cl. 198-235.000.

Beckman Instruments, Inc.: *See—*
Acord, William A., 3,960,497.

Beecham Group Limited: *See—*
Fake, Charles Sylvester, 3,960,879.
Fake, Charles Sylvester, 3,960,880.

Beekhuis, Gerrit E.; and Geurts, Leonardus H., to Stamicarbon B.V. Process for the preparation of unsaturated cyanocarbonyl compounds. 3,960,924, Cl. 260-465.900.

Beers, Melvin Dale; Chura, Harold; and Robillard, Robert Joseph, to General Electric Company. Process for the manufacture of a one-component room-temperature vulcanizable silicone composition. 3,960,802, Cl. 260-37.0SB.

Beiersdorf Aktiengesellschaft: *See—*
Petersen, Rudolf Theodor; and Fleck, Wolfgang, 3,960,878.

Beitz, Donald C.; and Phillips, Mitchell E., to Iowa State University Research Foundation, Inc. Method of measuring the fat and protein content in fluids. 3,960,493, Cl. 23-230.00B.

Bell, Allyn R.: *See—*
Plant, Howard L.; and Bell, Allyn R., 3,960,542.

Bell & Howell Company: *See—*
Pacholok, Jaroslaw, 3,960,373.
Sather, Eugene, 3,960,447.
Tiger, Emil, 3,960,042.

Bell Telephone Laboratories, Incorporated: *See—*
Carbrey, Robert Lawrence, 3,961,140.
Jarvis, John Frederick, 3,961,134.

Benda, David; and Davis, Charles Alfred, to GTE Sylvania Incorporated. Elongated getter support for cathode ray tube having rotatable member at end. 3,961,221, Cl. 313-481.000.

Bender, Paul E.; and Loev, Bernard, to SmithKline Corporation. Akenyl(or alkynyl) 9-xanthenyl ether compounds. 3,961,069, Cl. 424-283.000.

Bendix Corporation, The: *See—*
Fallon, Herbert J., 3,959,933.
Peterson, William A., Jr., 3,960,130.

Benes, Ivan, to Solco Basel AG. Process for the manufacture of injectable preparations of Tc99m and/or In113m and apparatus for carrying out the process. 3,961,038, Cl. 424-1.000.

Bennett, James G.; and Cooper, Glenn D., to General Electric Company. Process for the preparation of an amorphous polyphenylene oxide. 3,960,811, Cl. 260-47.0ET.

Bennett, William S., to Singer Company, The. Method and apparatus for combining video images with proper occlusion. 3,961,133, Cl. 178-6.800.

Benno, Edward Leonard; Schlueter, David Frederick; and Seymour, Lonnie Ray, to Illinois Tool Works Inc. System, machine and method for multipackaging containers. 3,959,949, Cl. 53-35.000.

Berard, Henri: *See—*
Cousin, Alain; and Berard, Henri, 3,961,324.

Berbner, Heinz: *See—*
Sander, Bruno; Berbner, Heinz; and Hoffmann, Manfred, 3,960,794.

Berg, Rudolph G., to Pfizer Inc. Preparation of citraconic acid. 3,960,901, Cl. 260-346.80R.

Bergwerksverband GmbH: *See—*
Juntgen, Harald; Knoblauch, Karl; Gappa, Gunther; and Schwarte, Jurgen, 3,960,529.
Munzner, Heinrich; Heimbach, Heinrich; Korbacher, Werner; Peters, Werner; Juntgen, Harald; Knoblauch, Karl; and Zundorf, Dieter, 3,960,522.
Munzner, Heinrich; Heimbach, Heinrich; Korbacher, Werner; Peters, Werner; Juntgen, Harald; Knoblauch, Karl; and Zundorf, Dieter, 3,960,769.

Berkelius, Hans. Device at hydraulic motor. 3,960,058, Cl. 91-224.000.

Berkenblit, Melvin; Lussow, Robert O.; and Reisman, Arnold, to International Business Machines Corporation. Glass composition. 3,961,114, Cl. 428-38.000.

Berkley, Marian: *See—*
Coleman, Henry Evans, 3,961,083.

Berkley, S. Thomas: *See—*
Hoffman, Bruce E.; and Berkley, S. Thomas, 3,961,226.

Berlin, Evan H. Balancing skill game. 3,960,376, Cl. 273-1.00E.

Bernard, Jean Rene; Brunel, Daniel Elie; Commeyras, Auguste Andre; Coste, Camille Michel; Itier, Jean Joseph; and Knoche, Hubert Wilhelm, to Entreprise de Recherches et d'Activites Petrolieres Elf. Catalytic composition for the conversion of hydrocarbons. 3,960,764, Cl. 252-429.00R.

Bernard, Rodolphe J. Viscous material dispenser. 3,960,294, Cl. 222-103.000.

Berner, Erling. Door closure. 3,960,196, Cl. 160-222.000.

Berninger, Kenneth L. Engine speed maintaining apparatus. 3,960,123, Cl. 123-103.00R.

Bertagnoli, Leopoldo, to Nuova San Giorgio S.p.A. Circular knitting machine cam arrangement. 3,959,994, Cl. 66-54.000.

Bertea Corporation: *See—*
York, Ray A., 3,960,361.

Bertholet, Raymond: *See—*
Hirsbrunner, Pierre; and Bertholet, Raymond, 3,960,942.

Bertus, Brent J.; Farha, Floyd, Jr.; and Johnston, Harlin D., to Phillips Petroleum Company. Catalyst compositions and their preparation. 3,960,773, Cl. 252-455.00R.

Besand, Roy T.; Carey, Paul L.; and Armstrong, David J., to Ralston Purina Company. Method of packaging fruit drinks. 3,961,088, Cl. 426-262.000.

Beschke, Helmut; Schaefer, Hans; Schreyer, Gerd; Schuler, Wilhelm Alfons; and Weigert, Wolfgang, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Catalyst for the production of pyridine and 3-methylpyridine. 3,960,766, Cl. 252-437.000.

Besenhard, Jurgen: *See—*
Fritz, Heinz Peter; and Besenhard, Jurgen, 3,960,594.

Bessant, Glyndwr A. R.; Eichamer, Paul D.; Koros, Robert M.; and Schieni, Steven R., to Exxon Research and Engineering Company. Trough-type scale traps. 3,960,508, Cl. 23-288.00R.

Bessen, Irwin I., to General Electric Company. Coated article and method and material of coating. 3,961,098, Cl. 427-34.000.

Bethe, Eugene J., to Uniroyal Inc. Methods of making foamed polymer trim pads for vehicle seats. 3,961,001, Cl. 264-46.400.

Betz Laboratories, Inc.: *See—*
Carter, David A.; and Vogt, Frederick G., 3,960,576.
Schieber, John R., 3,960,496.

Bewley, Adele Lorraine. Electric food mixer spatter guard. 3,960,370, Cl. 259-118.000.

Beyer, William F.; and Gleason, David D., to Upjohn Company, The. Automatic system for high pressure liquid chromatography. 3,960,003, Cl. 73-61.10C.

Bhandia, B. S., to Lawrence Peska Associates, Inc., a part interest. Ring having adjustably mounted rapidly rotatable indicia-bearing member. 3,959,989, Cl. 63-15.650.

BHS-Bayerische Berg Hutten-und Salzwerke Aktiengesellschaft: *See—*
Martin, Rolf, 3,960,028.

Bhuta, Pravin G.: *See—*
Schmidt, James L.; Jacoby, Jerold L.; Shaw, Garrett D.; and Bhuta, Pravin G., 3,960,448.

Biardi, Giuseppe, to Norton Company. Grinding wheel manufacture. 3,960,516, Cl. 51-293.000.

Bibi-Roubi, Albert; and Bibi-Roubi, Robert. Element for use in making a playing surface. 3,960,375, Cl. 272-3.000.

Bibi-Roubi, Robert: *See—*
Bibi-Roubi, Albert; and Bibi-Roubi, Robert, 3,960,375.

Bickers, Fredrick Allen, to Martin Engineering Co. Exhaust valve for a mold and core blowing machine. 3,960,173, Cl. 137-550.000.

Bickoff, Charles; and Hall, St. John Merrill, Jr., to Digital Equipment Corporation. Adjustable carriage apparatus. 3,960,256, Cl. 197-1.00R.

Bicron Corporation: *See—*
Noakes, John E., 3,960,756.

Biddle, William P.; and Tacker, John J., to Athens Stove Works, Inc. Method of making a gas range top burner. 3,959,866, Cl. 29-157.00R.

Bienert, Horst, to Webasto-Werk W. Baier KG. Sliding roof structure with two-way openable roof panel. 3,960,404, Cl. 296-137.00F.

Biensan, Michel: *See—*
Potin, Philippe; and Biensan, Michel, 3,960,846.

Biere, Helmut: *See—*
Ahrens, Hanns; Rufer, Clemens; Biere, Helmut; Schroder, Eberhard; Losert, Wolfgang; Loge, Olaf; and Schillinger, Ekkehard, 3,960,949.

Billany, Michael Royston; Longworth, Arthur Raymond; and Shatwell, John, to Imperial Chemical Industries Limited. Cleansing compositions. 3,960,745, Cl. 252-106.000.

Binsack, Rudolph: *See—*
Darsow, Gerhard; Schiller, Paul; Reese, Eckart; Bottenbruch, Lud-

wig; Binsack, Rudolph; Vernaleken, Hugo; and Wank, Joachim, 3,960,815.

Biorex Laboratories, Limited: *See*—
Chan, Rosalind Po-Kuen, 3,960,931.

Birchall, James Derek; and Cassidy, John Edward, to Imperial Chemical Industries Limited. Phosphates. 3,960,592, Cl. 106-308.00Q.

Birrell, Peter Leslie, to Cornelius Company, The. Container assembly for use with a separator dispenser. 3,960,298, Cl. 222-541.000.

Bishop, Gerald B.; and Gladden, David J., to Ford Motor Company. Carburetor power valve control apparatus. 3,960,990, Cl. 261-39.00A.

Bishop, Walton B.; and Hovey, John M., to United States of America, Navy. Biased-bit generator. 3,961,169, Cl. 235-152.000.

Bisson, Flavio; and Aprato, Armando, to Ing. C. Olivetti & C., S.p.A. Mounting mechanism for a non-impact dots-matrix print head. 3,960,255, Cl. 197-1.00R.

Biviator S.A.: *See*—
Adler, Karl; Ducommun, Georges; and Wantz, Charles A., 3,961,209.

Bjelvert, Sven William: *See*—
Svensson, Sven Torsten Arnold; and Bjelvert, Sven William, 3,960,453.

Bjermo, Gote Herbert Egard; and Tresjo, Paul Einar, to System AB Infoteknik. Method for sludge treatment. 3,960,725, Cl. 210-67.000.

Bjorklund, Knut Bertil. Cancer associated polypeptide antigen, process for its preparation, process for preparing antibodies, process of cancer diagnosis and composition useful as an immunizing agent. 3,960,827, Cl. 260-112.00R.

Black Clawson Company, The: *See*—
Seifert, Peter, 3,960,332.

Black, Sivalls & Bryson, Inc.: *See*—
Ebeling, Harold O.; and McMinn, Robert E., 3,960,519.

Blackburn, Dale W.; and Caldwell, Henry Cecil, to SmithKline Corporation. Alkanesulfonic acid salts of decinine. 3,960,870, Cl. 260-293.530.

Blair, Calvin B.; and Blair, John W. Tillage tool transport arrangement. 3,960,221, Cl. 172-311.000.

Blair, John W.: *See*—
Blair, Calvin B.; and Blair, John W., 3,960,221.

Blake, Alan Ronald: *See*—
Hutt, Peter Richard; Blake, Alan Ronald; von Cavallar, Gunter; Douglas, Brian Neil; and Dodds, Philip John, 3,961,137.

Blake, William W., to Caterpillar Tractor Co. Cartridge modulating valve. 3,960,172, Cl. 137-504.000.

Blanchard, Eugene J.: *See*—
Harper, Robert J., Jr.; Blanchard, Eugene J.; Lofton, John T.; and Gautreaux, Gloria A., 3,960,477.

Blank, Werner Josef, to American Cyanamid Company. Composition of matter comprising a blend of a polyether polyol and an aminoplast cross-linking agent. 3,960,983, Cl. 260-839.000.

Blatt, Victor, to Plessey Handel und Investments A.G. Improvement in or relating to integrated circuit arrangements. 3,961,351, Cl. 357-15.000.

Blaupunkt-Werke GmbH: *See*—
Hansen, Jens, 3,961,268.
Kochsmeier, Hans-Hermann, 3,961,275.

Blaylock, Arnold O., to Lectric Lite Company. Warning light apparatus for industrial vehicle use. 3,961,174, Cl. 240-8.180.

Blech- und Metallwarenfabrik Robert Fischbach KG: *See*—
Siemes, Franz; Kraus, Andreas; and Buhl, Joachim, 3,960,063.

Bledsoe, Woodrow W. Cotton ginning apparatus. 3,959,851, Cl. 19-48.00A.

Bleiche A.G.: *See*—
Stritzko, Vilem, 3,960,487.

Bliemeister, Robert M.: *See*—
Shy, James L.; and Bliemeister, Robert M., 3,959,890.

Block, Charles, to Joseph Galkin Corporation. High speed gearless fabric puller. 3,960,097, Cl. 112-214.000.

Blossey, Robert G.: *See*—
Manzonelli, Carmen C.; and Blossey, Robert G., 3,960,607.

Blount, David H. Process for the production of an acidic aqueous solution of silico-formic acid. 3,960,747, Cl. 252-182.000.

Blumenthal, Gunter, to Bochumer Eisenhutte Heintzmann & Company. Excavation-roof support. 3,959,976, Cl. 61-45.00D.

Bochumer Eisenhutte Heintzmann & Company: *See*—
Blumenthal, Gunter, 3,959,976.

Bodner, Ronald E.; Crooks, Thomas L.; Magrisso, Israel B.; Slack, Keith M.; and Smith, Richard S., to International Business Machines Corporation. Computer control apparatus. 3,961,313, Cl. 340-172.500.

Bodner, Ronald Eugene; Crooks, Thomas L.; Guest, John E.; Magrisso, Israel B.; and Slack, Keith K., to International Business Machines Corporation. Cycle interleaving during burst mode operation. 3,961,312, Cl. 340-172.500.

Boehringer Ingelheim GmbH: *See*—
Koppe, Herbert; Engelhardt, Albrecht; and Zeile, Karl, 3,961,071.

Boeing Company, The: *See*—
Emanuel, Mary Victoria, 3,961,096.

Boeker, Gilbert F.: *See*—
Boorse, Henry A.; Boeker, Gilbert F.; and Menke, John R., 3,960,468.

Boer, Karl W. Heat exchange apparatus. 3,960,207, Cl. 165-104.00R.

Bogaert, Pieter Joseph, to Manta. Device for unwinding thread and bobbin used therewith. 3,960,089, Cl. 112-228.000.

Bohanan, Charles S.; Jones, David H.; Raab, Harry F., Jr.; and Radkowsky, Alvin, to United States of America, Energy Research and Development Administration. Nuclear reactor for breeding U^{233}. 3,960,655, Cl. 176-18.000.

Bokalo, Peter: *See*—
Weldon, Lawrence A.; and Bokalo, Peter, 3,961,155.

Bolduc, Lee R. Electrosurgical and ECG monitoring system. 3,960,141, Cl. 128-2.06E.

Bolestova, Galina Ilinichna: *See*—
Zavyalov, Sergei Ivanovich; Rodionova, Natalya Alexandrovna; Parnes, Zinaida Naumovna; Bolestova, Galina Ilinichna; Filippov, Vladimir Vasilievich; and Zheleznaya, Lidia Lvovna, 3,960,884.

Boliver, Vincent J., to General Electric Company. Shielded power cable separable connector module having conducting contact rod with a beveled shoulder overlapped by insulating follower material. 3,960,433, Cl. 339-111.000.

Bondar, Larisa Nikolaevna: *See*—
Gortinskaya, Tatyana Vladimirovna; Mashkovsky, Mikhail Davidovich; Polezhaeva, Antonina Ivanovna; Nyrkova, Valentina Georgievna; Bondar, Larisa Nikolaevna; Litova, Galina Nikolaevna; Schukina, Maria Nikolaevna, deceased; and Preobrazhenskaya, Maria Nikolaevna, administrator, 3,961,058.

Bonne, Ulrich, to Honeywell Inc. Reflective displays. 3,960,438, Cl. 350-160.0LC.

Bontrager, Jacob. Deflector roller apparatus. 3,959,958, Cl. 56-314.000.

Boorse, Henry A.; Boeker, Gilbert F.; and Menke, John R., to United States of America, Energy Research and Development Administration. Fluid lubricated bearing assembly. 3,960,468, Cl. 417-424.000.

Boquet, Georges: *See*—
Chometon, Alain; and Boquet, Georges, 3,960,031.

Bordowsky, Karl-Heinz; Brendel, Uwe; and Bucksch, Manfred, to Zahnradfabrik Friedrichshafen AG. Hydraulic pressure regulator. 3,960,163, Cl. 137-56.000.

Bore, Pierre: *See*—
Ghilardi, Giuliana; Bore, Pierre; and Grollier, Jean-Francois, 3,960,476.

Borer, Charles: *See*—
Mosimann, Hans; Heim, Peter; and Borer, Charles, 3,960,799.

Borg-Warner Corporation: *See*—
Roberts, Richard W.; and Salle, Ralph D., 3,959,983.

Borsotti, Giampiero: *See*—
Ribaldone, Giuseppe; Borsotti, Giampiero; and Gonzati, Franco, 3,960,866.

Bortak, John J., to Wyandotte Corporation. Electrode support for filter press cells. 3,960,698, Cl. 204-267.000.

Bortak, John J.; Balko, Edward N.; Schweickart, Albert J.; and Collins, Stephen M., to BASF Wyandotte Corporation. Self supporting electrodes for chlor-alkali cell. 3,960,699, Cl. 204-268.000.

Bos, Karel; and Smit, Hendrik, to Scambia Industrial Developments AG. Hydraulic jack. 3,959,970, Cl. 60-477.000.

Bosch-Siemens Hausgerate GmbH: *See*—
Mayer, Rolf; and Menzel, Walter, 3,960,071.

Bosniack, David S., to Exxon Research and Engineering Company. Adhesive compositions and methods. 3,960,793, Cl. 260-28.5AS.

Bostian, Logan C.; and Winslow, Charles E., to Virginia Chemicals Inc. Method of removing sodium thiosulfate from a hydrosulfite reaction mixture. 3,961,034, Cl. 423-181.000.

Bottenbruch, Ludwig: *See*—
Darsow, Gerhard; Schiller, Paul; Reese, Eckart; Bottenbruch, Ludwig; Binsack, Rudolph; Vernaleken, Hugo; and Wank, Joachim, 3,960,815.
Vernaleken, Hugo; Bottenbruch, Ludwig; Emmer, Gerhard; and Hucks, Uwe, 3,960,968.

Bouchard, Robert Joseph; and Rogers, Donald Burl, to Du Pont de Nemours, E. I., and Company. Pyrochlore-based thermistors. 3,960,778, Cl. 252-519.000.

Bourdeau, Jean Paul; Seris, Jean Louis; and Pornin, Rene, to Societe Nationale des Petroles d'Aquitaine. Preparation of an enzyme-cellulose complex. 3,960,666, Cl. 195-68.000.

Bourquin, Jean-Pierre; Schwarb, Gustav; and Waldvogel, Erwin, to Sandoz Ltd. 9-Bromo-or chloro-9,10-dihydro-10-dihydro-10-alkoxy-4H-benzo[4,5]cyclo-hepta[1,2-b]thiophen-4-ones. 3,960,894, Cl. 260-332.30P.

Bowers, William S., to United States of America, Agriculture. Synthetic hormones for insect control. 3,960,902, Cl. 260-348.00R.

Bowley, Wallace W., to Intech, Inc. Method for oxygenating blood. 3,960,657, Cl. 195-1.800.

Bowman, Robert A.; Machol, Guenther Keith; and Terlet, Rene Henri, to International Business Machines Corporation. Time division multiplexed loop communication system with dynamic allocation of channels. 3,961,139, Cl. 179-15.0AL.

Bowyer, Ralph Mitchell, to Formica Corporation. Method and apparatus for controlling a press. 3,960,069, Cl. 100-38.000.

Boyle, Edward Michael Joseph; and Johnson, Melvin Harry, to Du Pont de Nemours, E. I., and Company. Slot vacuum jet. 3,960,305, Cl. 226-95.000.

BP Chemicals International Limited: *See*—
Gasson, Edward James; Krosnar, Thomas Charles; and Marrian, Stanley Frederic, 3,960,925.

Brack, Karl: *See*—
Beck, Siegfried; Brack, Karl; and Gansauge, Peter, 3,960,605.

Bracken, Joseph W., to Eaton Corporation. Cantilever mounting. 3,960,418, Cl. 308-184.00R.

Brackmann, Warren A.; and Dilanni, Daniel, to Rothmans of Pall Mall Canada Limited. Method and apparatus for the opening of tow. 3,960,645, Cl. 156-441.000.

Bradbery, Jack Leo: *See*—
Hollyday, Robert David; and Bradbery, Jack Leo, 3,961,295.

Braddon, David V.: *See*—
Ball, Frank J.; Braddon, David V.; and Stryker, Lynden J., 3,960,582.

Bradley, Ronnie A.; and Sease, John D., to United States of America, Energy Research and Development Administration. Preparation of high temperature gas-cooled reactor fuel element. 3,960,994, Cl. 264-.500.

Bradley, Steven Y., to Masonite Corporation. Scraping apparatus. 3,959,839, Cl. 15-93.00R.

Bradshaw, Robert S.: *See*—
Carbine, Joseph C.; and Bradshaw, Robert S., 3,960,264.

Bradshaw, Robert W.: *See*—
Thompson, Thomas D.; and Bradshaw, Robert W., 3,960,588.

Bramley, Anthony. Method of making netting by molding plastic about strand crossings. 3,961,011, Cl. 264-251.000.

Brand, John R., to Warwick Electronics Inc. Filter circuit. 3,960,043, Cl. 84-1.190.

Brandis, Curt; and Muller, Peter, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Production of flats for carding machines. 3,961,006, Cl. 264-138.000.

Brandt, Louis K. Self cleaning screen assembly. 3,960,731, Cl. 210-332.000.

Braukmann, Bernhard W.: *See*—
Vollmer, Rudolf; and Braukmann, Bernhard W., 3,960,358.

Braun, Klaus; Gabsch, Gunther; Forster, Werner; Ertel, Rolf; and Femmer, Klaus, to VEB Arzneimittelwerk Dresden. 21-Deoxydihydroajmaline derivatives. 3,960,859, Cl. 260-247.5FP.

Brawley, Thomas Scott. Bearing component. 3,960,419, Cl. 308-216.000.

Breedijk, Theo, to Hoogovens Ijmuiden, B.V. Weldable bar, especially for use in reinforcing concrete. 3,960,615, Cl. 148-36.000.

Breiter, Manfred W.: *See*—
Mitoff, Stephan P.; Powers, Robert W.; and Breiter, Manfred W., 3,960,596.

Bremen, Josef: *See*—
Arlt, Dieter; and Bremen, Josef, 3,960,915.

Brendel, Uwe: *See*—
Bordowsky, Karl-Heinz; Brendel, Uwe; and Bucksch, Manfred, 3,960,163.

Bresson, Clarence R., to Phillips Petroleum Company. Coalescence filter for oil-water dispersions. 3,960,719, Cl. 210-23.00R.

Bretti, Franco: *See*—
De Sandre, Giovanni; Subrizi, Angelo; and Bretti, Franco, 3,961,170.

Breu, Hanspeter: *See*—
Hofling, Erich; and Breu, Hanspeter, 3,960,622.

Breuer, Hermann, to E. R. Squibb & Sons, Inc. Amino-1,2,4-oxadiazolyl-3-acetyl cephalosporins. 3,960,849, Cl. 260-243.00C.

Breuer, Hermann: *See*—
Treuner, Uwe D.; and Breuer, Hermann, 3,960,850.

Brewster, Robert W.: *See*—
Warren, Lyle D.; and Brewster, Robert W., 3,960,041.

Bridgestone Tire Company Limited: *See*—
Azuma, Tosio; and Yonekawa, Hisashi, 3,960,260.
Yukuta, Toshio; Ohashi, Takashi; Taniguchi, Yoshiko; and Saito, Masumi, 3,960,980.

Briggs, Glenn E.; Beach, Edmund E.; and Chase, Walter P., to Motorola, Inc. Printed circuit board arrangement. 3,961,228, Cl. 317-101.00R.

Bristol-Myers Company: *See*—
Naito, Takayuki; Nakagawa, Susumu; and Toda, Soichiro, 3,960,833.

British Petroleum Company Limited, The: *See*—
Battersby, John; and Forbes, Eric Simon, 3,960,965.
Fazakerley, Stanley, 3,960,659.

British Titan Limited: *See*—
Tylko, Jozef Kazimierz, 3,960,544.

Broadie, Robert W.: *See*—
Aboaf, Joseph A.; Broadie, Robert W.; Hull, Edward M.; and Pogge, H. Bernhard, 3,961,353.

Brock, George W.; and Hahn, Frederick W., Jr.; to International Business Machines Corporation. Magnetic tape transport with slotted rotating head. 3,961,372, Cl. 360-102.000.

Broemer, Heinz; Meinert, Norbert; and Spincic, Johann, to Ernst Leitz GmbH, Optische Werke. Titanium dioxide containing glasses having a high index of refraction and a high dispersion and process of producing same. 3,960,579, Cl. 106-52.000.

Brokenshire, Robert E.; and Pratt, Robert G., to Detroit Edison Company, The. Fiber optic displacement transducer. 3,961,185, Cl. 250-231.00R.

Bronicki, Lucien Y., to Ormat Turbines (1965) Ltd. Supercharger system for combustion engine. 3,961,199, Cl. 290-52.000.

Brotman, Morley: *See*—
High, Cliff R.; and Brotman, Morley, 3,960,257.

Brotzmann, Karl: *See*—
Rote, Franklin E.; and Brotzmann, Karl, 3,960,546.

Brown, Clarence Eugene. Method of building construction using synthetic foam material. 3,961,002, Cl. 264-46.500.

Brown, Francis B.; and Erickson, John W., to Kobe Inc. Centrifugal separator. 3,960,319, Cl. 233-19.00R.

Brown, Melancthon S., deceased (by Kohn, Gustave K., special administrator), to Chevron Research Company. N-cycloalkyldithio-N'-fluorophenyl ureas. 3,960,943, Cl. 260-453.00R.

Brown, Pedro, Jr., to RCA Corporation. Memory dial for teletypewriter subscribers. 3,961,130, Cl. 178-2.00E.

Brown, Richard E.; and Shavel, John, Jr., to Warner-Lambert Company. Benzopyrano(3,4-C)pyridine bronchodilators. 3,961,057, Cl. 424-248.000.

Brown, Robert Saul, to Deering Milliken Research Corporation. Circular knitting machine with cantilevered, pivotally mounted platform. 3,959,991, Cl. 66-8.000.

Browning-Ferris Industries, Inc.: *See*—
Cradeur, Robert R.; and Holloway, Ronald Webb, 3,959,845.

Bruce, Walter Esmond. Manufacture of agricultural discs. 3,959,863, Cl. 29-148.300.

Brunel, Daniel Elie: *See*—
Bernard, Jean Rene; Brunel, Daniel Elie; Commeyras, Auguste Andre; Coste, Camille Michel; Itier, Jean Joseph; and Knoche, Hubert Wilhelm, 3,960,764.

Brunetti, Heimo: *See*—
Orban, Ivan; Lind, Hanns; Brunetti, Heimo; and Rody, Jean, 3,960,875.

Brunswick Corporation: *See*—
Parks, Dewey P.; and Scott, Charles R., 3,960,650.

Bruzas, John A.: *See*—
Schenk, Raymond L., Jr.; Bruzas, John A.; and Coville, William E., 3,960,602.

Bruzzese, Tiberio; and Ghielmetti, Giuseppe, to SPA-Societa Prodotti Antibiotici S.p.A. Esters of partricin derivatives. 3,961,047, Cl. 424-122.000.

Brych, Alfred, to Saft-Societe des Accumulateurs Fixes et de Traction. Electrical voltage indicating device. 3,961,253, Cl. 324-94.000.

Brzeski, Lech Andrzej; Kazimierski, Zbyszko Kazimierz; Krysinski, Jan Eugeniusz; and Siwek, Andrzej Witold, to Politechnika Lodzke. Gas-lubricated bearing. 3,960,414, Cl. 308-9.000.

Buchele, Ferdinand: *See*—
Leimbacher, Erwin; Marte, Walter; and Buchele, Ferdinand, 3,960,484.

Bucksch, Manfred: *See*—
Bordowsky, Karl-Heinz; Brendel, Uwe; and Bucksch, Manfred, 3,960,163.

Budilovsky, Viktor Alexandrovich: *See*—
Filatov, Nikolai Grigorievich; Gridnev, Vitaly Nikiforovich; Gavriljuk, Valentin Gennadievich; Meshkov, Jury Yakovlevich; Mashlenko, Felix Isaakovich; Mikhailov, Konstantin Vasilievich; Fedorov, Valery Ionovich; Marchenko, Vladimir Zakharovich; Lyskov, Ivan Konstantinovich; and Budilovsky, Viktor Alexandrovich, 3,959,999.

Budlane, Stanley J., to General Electric Company. Thermal timer, thermal actuator, control system and circuit. 3,961,300, Cl. 337-303.000.

Bugaenko, Lenar Timofeevich: *See*—
Baranova, Rimma Bronislavovna; Lazarev, Vladimir Ilich; Mironov, Nikolai Petrovich; Pinaev, Viktor Alexandrovich; Bugaenko, Lenar Timofeevich; Kalyazin, Evgeny Petrovich; Panferova, Alexandra Timofeevna; Byakov, Vsevolod Mikhailovich; Nikeshichev, Jury Nikolaevich; and Petryaev, Petrovich Evgeny, 3,960,682.

Buhl, Joachim: *See*—
Siemes, Franz; Kraus, Andreas; and Buhl, Joachim, 3,960,063.

Buhler, Erich, to Muller, Jacob. Ribbon weaving loom construction. 3,960,185, Cl. 139-307.000.

Bujan, Albert Frank, to Abbott Laboratories. Flow control device. 3,960,149, Cl. 128-214.00R.

Buker, Edward, to Coach & Car Equipment Corporation. Seat with anti-theft structure. 3,960,406, Cl. 297-345.000.

Bunker Ramo Corporation: *See*—
Mathe, Istvan, 3,959,868.

Bunnell, Edward Dennman; Fleischhacker, James Earl; and Tennant, Robert John, to AMP Incorporated. Flat wiring system and crimped connection. 3,960,430, Cl. 339-97.00C.

Burger, Alex; Kaiser, Hermann; and Ludovici, Werner, to Bayer Aktiengesellschaft. Production of strong active carbon moldings. 3,960,761, Cl. 252-421.000.

Burkall, Alvin Edward, to Whirlpool Corporation. Removable lint screen assembly for a dryer. 3,959,891, Cl. 34-82.000.

Burke, William. Combination mattress, mattress insert, and commode. 3,959,833, Cl. 5-90.000.

Burroughs Corporation: *See*—
Carbine, Joseph C.; and Bradshaw, Robert S., 3,960,264.
Flora, Laurence Paul, 3,961,284.
Frischer, Myles E., 3,961,217.
Kobylarz, Lawrence P.; and Mack, Ronald H., 3,961,371.
Vause, Arthur Samuel, 3,960,278.

Burton, Brian: *See*—
Elks, Joseph; Weir, Niall Galbraith; Gane, Timothy Larry; and Burton, Brian, 3,960,940.

Busch, Peter: *See*—
Story, Paul Richard; Busch, Peter; Denson, Donald Derby; and Wright, Carl Edward, 3,960,897.

Buschini, Anthony Alan; and Swarsbrick, Douglas Edward, to Parsons Controls Limited. Kelly's eye component for a fishing trawl. 3,959,909, Cl. 43-8.000.

Butler, Donald: *See*—
Shackleton, Frank; and Butler, Donald, 3,960,948.

Butler, James W., to Ford Motor Company. Magnetization of iron chromium system. 3,960,723, Cl. 210-42.00S.

Butuzov, Vladimir Petrovich; Vatolkin, Evgeny Konstantinovich; Gordienko, Leonid Alexandrovich; Feldman, Ernst Borisovich; Khadzhi, Valentin Evstafievich; and Shaposhnikov, Anatoly Alexandrovich. Apparatus for growing crystals from hydrothermal solutions. 3,960,501, Cl. 23-273.00H.

Buxbaum, Lothar: *See*—
Morawetz, Gottfried; and Buxbaum, Lothar, 3,960,817.

Buxton, Richard L. Physiological monitoring system. 3,960,140, Cl. 128-2.06R.

Byakov, Vsevolod Mikhailovich: *See*—
Baranova, Rimma Bronislavovna; Lazarev, Vladimir Ilich; Mironov, Nikolai Petrovich; Pinaev, Viktor Alexandrovich; Bugaenko, Lenar Timofeevich; Kalyazin, Evgeny Petrovich; Panferova, Alexandra Timofeevna; Byakov, Vsevolod Mikhailovich; Nikeshichev, Jury Nikolaevich; and Petryaev, Petrovich Evgeny, 3,960,682.

Byrne, John Frank, to Xerox Corporation. Composition and method for repairing selenium photoreceptors. 3,959,934, Cl. 51-317.000.

Cabot Corporation: *See*—
Hayes, Jimmie R., 3,960,001.

Cabut, Louis Antoine: *See*—
Huille, Michel Ernest Antoine; and Cabut, Louis Antoine, 3,960,587.

Caccavale, John L.; Pierce, Victor J.; Young, Robert W.; and Prussin, Samuel B. Process for producing flavored popcorn. 3,961,091, Cl. 426-307.000.

Cacciola, John; and Thomas, David W., to PRF, Inc. Amplitude modulated transmitter. 3,961,287, Cl. 332-37.00D.

Caffine, George S. Method and apparatus for automatically annunciating the completion of a telephone call hold interval. 3,961,142, Cl. 179-81.00R.

Cain, Patrick J.: *See*—
Roepke, Wallace W.; and Cain, Patrick J., 3,960,009.

Calbo, Leonard Joseph, Jr., to American Cyanamid Company. Process for electrodepositing coatings on metal. 3,960,688, Cl. 204-181.000.

Caldwell, Henry Cecil: *See*—
Blackburn, Dale W.; and Caldwell, Henry Cecil, 3,960,870.

Calehuff, Girard L., to Westvaco Corporation. Shear pump headbox. 3,960,654, Cl. 162-342.000.

Campbell, Charles R.; Danly, Donald E.; and Mueller, Werner H., to Monsanto Company. Process for hydrodimerizing olefinic compounds. 3,960,679, Cl. 204-73.00A.

Campbell, Donn V., to United States of America, Army. Lossy cable choke broadband isolation means for independent antennas. 3,961,331, Cl. 343-792.000.

Campbell, John J., to Caterpillar Tractor Co. Mounting arrangement for a hydraulic motor. 3,960,061, Cl. 91-506.000.

Canac Consultants Limited: *See*—
Vezina, Georges E., 3,960,005.

Canadian Patents and Development Limited: *See*—
Sparks, Bryan D., 3,961,005.

Canadian Porcelain Company Limited: *See*—
Rosenblatt, Gordon, 3,960,779.

Canon Kabushiki Kaisha: *See*—
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Goshima, Takeshi; Sugiura, Yoshinori; Endo, Kiyonobu; Sato, Hideaki; Kono, Kimio; and Tsuji, Takao, 3,960,443.
Hosoe, Kazuya; Aizawa, Hiroshi; Matsumoto, Seiichi; and Yokota, Hideo, 3,961,178.
Kamiya, Osamu; and Itoh, Susumu, 3,960,441.
Yokoyama, Noboru, 3,961,315.

Capetti, Federico, to Societa' Nebiolo S.p.A. Rotary printing press. 3,960,079, Cl. 101-232.000.

Cappel, Fred Erich: *See*—
Schmalfeld, Paul; Sauter, Dieter; and Cappel, Fred Erich, 3,960,543.

Caputi, Arthur, Jr.; and Wong, Thomas C., to E & J Gallo Winery. Continuous process for making fibrous cellulose acetate filter material. 3,961,007, Cl. 264-140.000.

Carbine, Joseph C.; and Bradshaw, Robert S., to Burroughs Corporation. Item transport apparatus. 3,960,264, Cl. 198-179.000.

Carbrey, Robert Lawrence, to Bell Telephone Laboratories, Incorporated. Line switch controller for a time-division switching system. 3,961,140, Cl. 179-15.0AT.

Cardone, Paul A., to Polaroid Corporation. Dye free, spectrally sensitive silver halide layers in diffusion transfer films. 3,960,558, Cl. 96-3.000.

Carella, Richard F.; Podolan, Edward G.; and Przybysz, Francis C., to General Motors Corporation. Retractable roof closure. 3,960,403, Cl. 296-137.00B.

Carey, Helen L., to Raymond Lee Organization, Inc., The, a part interest. Medication timing sealing device. 3,960,713, Cl. 206-534.000.

Carey, Jane Towne; and Fracchia, Alfred Andrew. Apparatus for the palliative treatment of pleural effusions. 3,960,153, Cl. 128-347.000.

Carey, Paul L.: *See*—
Besand, Roy T.; Carey, Paul L.; and Armstrong, David J., 3,961,088.

Carl Hurth, Maschinen- und Zahnradfabrik: *See*—
Eichinger, Johann, 3,960,029.

Carleton, Joseph G.; and Sweet, Richard G., to Leland Stanford Junior University, The Board of Trustees of. Measurement of angular dependence of scattered light in a flowing stream. 3,960,449, Cl. 356-103.000.

Carney, Richard William James, to Ciba-Geigy Corporation. 2-Phenoxy-alkanoic acids. 3,960,874, Cl. 260-293.820.

Carney, William V.: *See*—
DeLuca, Paul V.; and Carney, William V., 3,961,227.

Carpaneti, Edoardo: *See*—
Vargiu, Silvio; Carpaneti, Edoardo; and Passalenti, Beppino, 3,960,981.

Carpenter, Emerl R., to American Hoist & Derrick Company. Hydraulic backhoe circuitry. 3,960,284, Cl. 214-138.00R.

Carter, David A.; and Vogt, Frederick G., to Betz Laboratories, Inc. Silicate-based corrosion inhibitor. 3,960,576, Cl. 106-14.000.

Carter, Joseph F.: *See*—
Workman, William, Jr.; and Carter, Joseph F., 3,960,035.

Casadevall, James L., to Martin Marietta Corporation. Method of making high performance ablative tape. 3,960,626, Cl. 156-93.000.

Cassella Farbwerke Mainkur Aktiengesellschaft: *See*—
Heinrich, Ernst; Mix, Konrad; and Ribka, Joachim, 3,960,480.

Cassidy, John Edward: *See*—
Birchall, James Derek; and Cassidy, John Edward, 3,960,592.

Cassimally, Khalil Ahmad Ibrahim. Collapsible trolley and portable case. 3,960,252, Cl. 190-18.00A.

Catalysts and Chemicals Industries Co., Ltd.: *See*—
Sanga, Seiji; and Nishimura, Yoichi, 3,960,760.

Caterpillar Tractor Co.: *See*—
Blake, William W., 3,960,172.
Campbell, John J., 3,960,061.
Greiner, Jonny R., 3,959,968.
Klett, Gene Ralph, 3,959,901.
Latimer, Eugene E.; and Lorimor, Larry W., 3,960,174.
McClure, Randall D.; and Marques, Jerry G., 3,960,238.
Schexnayder, Lawrence F., 3,960,059.
Shuler, James R., 3,960,412.
Van Wuytswinkel, Charles M. G., 3,960,230.
Wagner, Ernest W., 3,959,896.
Westervelt, Ralph, 3,960,415.

Cattien, Eckart: *See*—
Kuligowski, Gerd; and Cattien, Eckart, 3,961,205.

Cavaliere, Joseph R.; and Robortaccio, Rocco, to International Business Machines Corporation. Testing embedded arrays. 3,961,254, Cl. 324-73.0AT.

Celanese Coatings & Specialties Company: *See*—
Hicks, Darrell D., 3,960,824.

Cengel, John A.: *See*—
Puskas, Imre; and Cengel, John A., 3,960,900.

Centaur Chemical Co.: *See*—
Avakian, Souren; and Seneca, Harry, 3,960,658.

Center for Management Services and Applied Research: *See*—
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Centre d'Etudes et de Realisations Industrielles de l'Atlantique C.E.R.I.A.: *See*—
Chardonneau, Joel; and Sable, Claude, 3,959,967.

Cerini, Costantino Peter, to American Cyanamid Company. Mumps vaccine and preparation thereof. 3,961,046, Cl. 424-89.000.

Certain-teed Products Corporation: *See*—
Eberl, James Joseph; Thelen, Edmund; and Heller, Harold L., 3,961,105.

Chadwick, Kenneth E.: *See*—
Chia, E. Henry; and Chadwick, Kenneth E., 3,960,606.

Chafetz, Harry: *See*—
Cullen, William P.; Chafetz, Harry; and Miller, Edward F., 3,960,889.

Chambers, George Sutton; and Sinclair, Carter, to General Electric Company. Adaptive filtering. 3,961,234, Cl. 318-561.000.

Champion, Fred; and Kern, Thomas W., to Olin Corporation. Novel anode adjustment apparatus. 3,960,694, Cl. 204-219.000.

Chan, Kingsley: *See*—
Sweet, John R., II; and Chan, Kingsley, 3,960,293.

Chan, Rosalind Po-Kuen, to Biorex Laboratories, Limited. 1,2-Diphenyl-ethane derivatives. 3,960,931, Cl. 260-479.00R.

Chandra, Grish; and Rowland, Colin Mostyn, to Dow Corning Limited. Coating process. 3,960,810, Cl. 260-46.5UA.

Chang, Chi S.: *See*—
Abbas, Shakir A.; Chang, Chi S.; Freeman, Leo B., Jr.; and Knepper, Ronald W., 3,961,355.

Change, Nicholas D.; and Riggs, Michael T., to PCB Piezotronics, Inc. Conformal pressure transducer. 3,960,018, Cl. 73-398.00R.

Chapman, Richard B., to United States of America, Navy. Pressurized ship structure for slamming loads. 3,960,100, Cl. 114-61.000.

Chardonneau, Joel; and Sable, Claude, to Centre d'Etudes et de Realisations Industrielles de l'Atlantique C.E.R.I.A. Reciprocating apparatus particularly for pump unit. 3,959,967, Cl. 60-382.000.

Charron, Louis Donald: *See*—
MacKenzie, Morley Scott; Charron, Louis Donald; Dooley, Andrew Philip Charles; and Lee, John Davidson, 3,960,431.

Chartet, Andre, to Societe Anonyme des Usines Chausson. Device for fixing tube plates and lateral flanges of heat exchangers. 3,960,210, Cl. 165-149.000.

Chase-Shawmut Company, The: *See*—
Salzer, Erwin, 3,959,875.

Chase, Walter P.: *See*—
Briggs, Glenn E.; Beach, Edmund E.; and Chase, Walter P., 3,961,228.

Chavee, Rene M., to Fabrique Nationale Herstal S.A. en abrege FN. Fuse for rifle-grenade. 3,960,084, Cl. 102-65.200.

Chemical Cleaning Composition Trust: *See*—
Leonard, Edward O., 3,960,742.

Chemie Linz Aktiengesellschaft: *See—*
Hollinger, Roderich; Wendtlandt, Wolf; and Schneider, Gerda, 3,960,960.
Mayr, Hubert; Presoly, Elfriede; Weinrotter, Ferdinand; Muller, Walter; Stern, Gerhard; and Frohner, Walter Mizzi, deceased, 3,960,541.

Chemische Werke Huls Aktiengesellschaft: *See—*
Magosch, Karl Heinz; Feinauer, Roland; and Ruter, Jorn, 3,960,686.

Chemko Industries, Inc.: *See—*
Cyphert, Gilbert G., 3,959,844.

Chen, Chang Chung; Holmes, Jack K.; and Lewis, James L., to United States of America, Navy. Tracking status detector for a digital delay lock loop. 3,961,282, Cl. 331-1.00R.

Cheney, Richard F.: *See—*
Port, David J.; Lafferty, William D.; and Cheney, Richard F., 3,960,545.

Chester, Arthur N.: *See—*
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Chevron Research Company: *See—*
Brown, Melancthon S., deceased, 3,960,943.
Honnen, Lewis R., 3,960,515.
Hutchison, Stanley O.; and Anderson, Glenn W., 3,960,014.
Hutchison, Stanley O.; and Mitchell, Neal L., 3,960,211.
Hutchison, Stanley O., 3,960,212.
Mitchell, Neal L., 3,960,215.
Stayner, Robert A., 3,960,613.
Stayner, Robert A., 3,960,614.

Chia, E. Henry; and Chadwick, Kenneth E., to Southwire Company. Aluminum silicon alloy and method of preparation thereof. 3,960,606, Cl. 148-2.000.

Chino, Shigeru; Miyazaki, Nobuto; and Takahashi, Tadaya, to Nigata Engineering Co., Ltd. Fluid loading device. 3,960,176, Cl. 137-615.000.

Chiyomaru, Isao: *See—*
Horii, Tetsuo; Chiyomaru, Isao; Kawada, Seigo; and Takita, Kiyoshi, 3,961,049.

Cho, Jin Sul. Kite. 3,960,346, Cl. 244-155.00A.

Chodosh, Stewart M., to Leesona Corporation. Anode construction. 3,960,600, Cl. 136-120.00R.

Choksi, Pradip V.; and Steidley, Roy B., to American Hospital Supply Corporation. Medical liquid container with tactile sterility indicator and method of testing container. 3,960,002, Cl. 73-52.000.

Chometon, Alain; and Boquet, Georges, to Regie Nationale des Usines Renault; and Automobiles Peugeot. Collapsible steering columns. 3,960,031, Cl. 74-492.000.

Choong, Alan Chong Seong. Music teaching device. 3,960,046, Cl. 84-471.00R.

Chou, Albert S., to Shugart Associates. Line printer having hammer which spans three print positions. 3,960,074, Cl. 101-93.140.

Christmann, Harold F.; and Miklas, Edward J., to Petro-Tex Chemical Corporation. Modified zinc ferrite oxidative dehydrogenation catalysts. 3,960,767, Cl. 252-437.000.

Chu, Gordon P. K., to GTE Sylvania Incorporated. Lamp having crystallizable light diffusing envelope. 3,960,533, Cl. 65-33.000.

Chura, Harold: *See—*
Beers, Melvin Dale; Chura, Harold; and Robillard, Robert Joseph, 3,960,802.

Ciba-Geigy AG: *See—*
Morawetz, Gottfried; and Buxbaum, Lothar, 3,960,817.

Ciba-Geigy Corporation: *See—*
Carney, Richard William James, 3,960,874.
Duerr, Dieter; and Pissiotas, Georg, 3,960,947.
Ferrini, Pier Giorgio; Haas, Georges; and Rossi, Alberto, 3,960,868.
Furia, Thomas E.; and Steinberg, David H., 3,961,054.
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Orban, Ivan; Lind, Hanns; Brunetti, Heimo; and Rody, Jean, 3,960,875.
Ramey, Chester R.; and Luzzi, John J., 3,960,809.
Renner, Alfred; and Haug, Theobald, 3,960,812.
Seltzer, Raymond; and Sherman, Paul D., 3,960,783.

Cincinnati Milacron, Inc.: *See—*
Kelly, Ralph; and Ritter, Edmond Jean, 3,961,044.
Piotrowski, Tadeusz Wiktor, 3,960,381.

Cirule, Fred M.; and Preziosi, Joseph R., to Amerace Corporation. Expansion clamp. 3,960,395, Cl. 285-370.000.

Cities Service Company: *See—*
Rosen, Bernard H.; Pelofsky, Arnold H.; and Greene, Marvin, 3,960,700.

Clark, Duncan, to Imperial Chemical Industries Limited. Production of esters. 3,960,930, Cl. 260-475.00N.

Clark Equipment Company: *See—*
McKenzie, Ian, 3,960,371.

Clark, Frederick G., to Eastman Machine Company. Cloth cutting machine with wick lubricator. 3,960,244, Cl. 184-6.140.

Clark, James Monroe: *See—*
Cohen, Stuart Barry; Clark, James Monroe; and Magnus, Arthur Howard, 3,961,136.

Cleary, Robert A.: *See—*
Mort, Paul R., Jr.; and Cleary, Robert A., 3,960,640.

Clement, James H. Mail box with signal attachment. 3,960,317, Cl. 232-35.000.

Close, James R.; Wood, William P.; Hatch, Robert A.; and Johnson, James R., to Minnesota Mining and Manufacturing Company. Method of containing a resiliently supported rigid ceramic catalyst support. 3,959,865, Cl. 29-157.00R.

Cloud, Robert H.; and Hopton, Edward J., to A.M. Industries. Heated air recycle arrangement. 3,959,892, Cl. 34-131.000.

Clovis, James S.; and Dohling, Jerome, to Rohm and Haas Company. Quinones as corrosion inhibitor in distilling alkanoic acids. 3,960,671, Cl. 203-7.000.

Clyburn, Charles W.: *See—*
Piaget, Robert E.; and Clyburn, Charles W., 3,960,427.

Coach & Car Equipment Corporation: *See—*
Buker, Edward, 3,960,406.

Cochoy, Robert E., to United States of America, Air Force. Poly (perfluoroalkylene oxide) oxadiazoles and their synthesis. 3,960,814, Cl. 260-47.00R.

Coetzee, Chris. Refuse devices. 3,960,351, Cl. 248-101.000.

Coggins, Robert W., to Combustion Engineering, Inc. Oil-gas separator having defoaming structure. 3,960,525, Cl. 55-178.000.

Cohen, Stuart Barry; Clark, James Monroe; and Magnus, Arthur Howard, to International Telephone and Telegraph Corporation. Digital data transmit and receive channel modem. 3,961,136, Cl. 178-67.000.

Cole, Robert Clay; Koch, Ronney R.; and Ramos, Joseph, to Halliburton Company. Pumpable epoxy resin composition. 3,960,801, Cl. 260-33.6EP.

Cole, William L., to Wilkinson Sword Limited. Members having a cutting edge. 3,960,608, Cl. 30-346.540.

Coleman, Arthur Edward: *See—*
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Coleman, Henry Evans, to Berkley, Marian, a part interest. Meat flavored vegetable protein product. 3,961,083, Cl. 426-92.000.

Colgate-Palmolive Company: *See—*
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Bauman, Robert Andrew, 3,961,075.

Colligan, Francis S. Apparatus and method for testing the condition of an antenna monitoring system. 3,961,260, Cl. 325-133.000.

Collins, Stephen M.: *See—*
Bortak, John J.; Balko, Edward N.; Schweickart, Albert J.; and Collins, Stephen M., 3,960,699.

Colton, Douglas Roy; and Rosenbaum, Stanley Daniel, to Northern Electric Company Limited. Multi-ripple charge coupled device. 3,961,352, Cl. 357-24.000.

Combustion Engineering, Inc.: *See—*
Coggins, Robert W., 3,960,525.

Comision Nacional de Energia Atomica: *See—*
Varotto, Conrado F.; Audero, Miguel Angel; Vasallo, Daniel I.; Pascual, Roberto; and Ruffo, Hector J., 3,960,548.

Commercial Solvents Corporation: *See—*
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Commeyras, Auguste Andre: *See—*
Bernard, Jean Rene; Brunel, Daniel Elie; Commeyras, Auguste Andre; Coste, Camille Michel; Itier, Jean Joseph; and Knoche, Hubert Wilhelm, 3,960,764.

Commissariat a l'Energie Atomique: *See—*
Faure, Jacqueline; Malmejac, Yves; and Schaub, Bernard, 3,960,647.
Lazzari, Jean-Pierre; and Melnick, Igor, 3,961,299.

Compagnie Industrielle des Telecommunications Cit-Alcatel: *See—*
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Jouanneault, Jean-Pierre, 3,959,876.

Compagnie Internationale pour l'Informatique: *See—*
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Compania Metalurgica Austral Argentina: *See—*
Varotto, Conrado F.; Audero, Miguel Angel; Vasallo, Daniel I.; Pascual, Roberto; and Ruffo, Hector J., 3,960,548.

Conley, James F., to Maremont Corporation. Automatic firearm having anti-bounce sear. 3,960,053, Cl. 89-149.000.

Conrad, Herbert M.: *See—*
Gaines, Jerome; and Conrad, Herbert M., 3,960,632.

Consonni, Pietro: *See—*
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Consortium fur Elecktrochemische Industrie GmbH: *See—*
Seiter, Hartmut, 3,960,619.

Construction Products Research, Inc.: *See—*
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Continental Can Company, Inc.: *See—*
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Continental Oil Company: *See—*
Kegler, William H.; and Huyser, Marvin E., 3,960,704.

Controls Company of America: *See—*
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Controltek, Inc.: *See—*
Fagg, George A., 3,961,233.

Convain, Michel, to S. A. Pronal. Tank capable of being carried by a helicopter. 3,960,192, Cl. 150-1.000.

Conway, Bernard W.; and Moran, James, to Dexter Corporation, The. Process of forming wet laid tufted nonwoven fibrous web and tufted product. 3,960,652, Cl. 162-108.000.

Conway, John E., to Universal Oil Products Company. Hydrodesulfurization of asphaltene-containing black oil with a gamma-alumina composite catalyst of specified particle density. 3,960,712, Cl. 208-216.000.

Cook Electric Company: *See*—
Splitt, Frank G., 3,961,229.

Cooper, David J.; Hoover, John R. E.; and Weisbach, Jerry A., to SmithKline Corporation. Mercaptopseudodisaccharides. 3,960,838, Cl. 260-210.0AB.

Cooper, Glenn D., to General Electric Company. Polypheylene ether-resin compositions with organopolyiloxanes having silicon-H-bonds. 3,960,985, Cl. 260-874.000.

Cooper, Glenn D.: *See*—
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Copal Company Limited: *See*—
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Cordes Europe France: *See*—
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Cornelius Company, The: *See*—
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Corning Glass Works: *See*—
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Kohanzadeh, Youssef; and Smith, Roy E., 3,960,531.
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Cornwell Research Foundation, Inc.: *See*—
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Coste, Camille Michel: *See*—
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Cote, Gerald M., to Thermanil Chemical Company, Incorporated. Process for tanning leather. 3,960,481, Cl. 8-94.260.

Cotton, C. W. Tree climbing device. 3,960,240, Cl. 182-20.000.

Coucoulas, Alexander, to Western Electric Company, Inc. Method of forming an integrated circuit assembly. 3,959,874, Cl. 29-577.000.

Coucoulas, Alexander, to Western Electric Company, Inc. Method of depositing a metal on a surface comprising an electrically non-conductive ferrite. 3,960,674, Cl. 204-16.000.

Coulter Electronics, Inc.: *See*—
Coulter, Wallace H., 3,961,249.

Coulter, Wallace H., to Coulter Electronics, Inc. Particle size distribution analyzation employing trailing edge differentiation. 3,961,249, Cl. 324-71.0CP.

Cousin, Alain; and Berard, Henri, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Multiple receiver screen type picture displaying device. 3,961,324, Cl. 340-324.0AD.

Coville, William E.: *See*—
Schenk, Raymond L., Jr.; Bruzas, John A.; and Coville, William E., 3,960,602.

Cox, David Alexander; Danilewicz, John Christopher; Ham, Allan Leslie; Kemp, John Edward Glyn; and Snarey, Michael, to Pfizer Inc. Phenoxypropanolamine therapeutic agents. 3,961,072, Cl. 424-324.000.

Cox, James Patrick; and Cox, Jeanne Marie, to Martin, Robertson & Bain Ltd. Rice-treating method and rice products. 3,961,084, Cl. 426-93.000.

Cox, Jeanne Marie: *See*—
Cox, James Patrick; and Cox, Jeanne Marie, 3,961,084.

Cox, Lyndon S.: *See*—
Ostdiek, Arthur J.; and Cox, Lyndon S., 3,960,022.

Coyle, Roy Thomas, to Du Pont de Nemours, E. I., and Company. Gold compositions. 3,960,777, Cl. 252-514.000.

CPC International Inc.: *See*—
Tamura, Masaki; Ushiro, Soichiro; and Hasagawa, Shiro, 3,960,663.

Cradeur, Robert R.; and Holloway, Ronald Webb, to Browning-Ferris Industries, Inc. Apparatus and method for cleaning mining cars. 3,959,845, Cl. 15-321.000.

Cragar Industries, Inc.: *See*—
Liffick, Fenton A., 3,960,047.

Crane, Edward J., to Barker International, Inc. Counter-rotating fowl picker. 3,959,850, Cl. 17-11.10R.

Craven, Robert B., to Analog Devices, Inc. Solid state digital to analog converter. 3,961,326, Cl. 340-347.0DA.

Crisci, Joseph R.: *See*—
Hering, Frederic S.; Ohlbaum, Robert H.; and Crisci, Joseph R., 3,960,459.

Crooks, Thomas L.: *See*—
Bodner, Ronald E.; Crooks, Thomas L.; Magrisso, Israel B.; Slack, Keith M.; and Smith, Richard S., 3,961,313.
Bodner, Ronald Eugene; Crooks, Thomas L.; Guest, John E.; Magrisso, Israel B.; and Slack, Keith K., 3,961,312.

Crosby, Wayne Howard, to General Foods Corporation. Growth regulation in lawn care. 3,960,540, Cl. 71-76.000.

Crossley, Thomas J., to Westinghouse Electric Corporation. Cyclic process for re-use of waste water generated during the production of UO_2. 3,961,027, Cl. 423-6.000.

Crouch, Dell A.: *See*—
Werth, John; Crouch, Dell A.; and Sklarchuk, Jack C., 3,960,597.

Crouzet: *See*—
Vergues, Jacques, 3,961,211.

Crown Zellerbach Corporation: *See*—
Hartbauer, Ellsworth A.; and Rehr, Henry W., 3,960,272.

CTS Corporation: *See*—
Hufford, James N., 3,961,302.

Culbertson, George S., to Standard Oil Company. Mono or bis 3-(polypropyl or butyl-propenyl)-amino alkyl piperazines. 3,960,865, Cl. 260-268.0PL.

Cullen, William P.; Chafetz, Harry; and Miller, Edward F., to Texaco Inc. Dehydrohalogenated polyalkene-maleic anhydride reaction product. 3,960,889, Cl. 260-326.50E.

Cumberland Engineering Company, Inc.: *See*—
Wudyka, Joseph Paul, 3,960,334.

Cumpston, Edward H., Jr. Air scrubber. 3,960,524, Cl. 55-86.000.

Curran, Adrian Charles Ward, to John Wyeth & Brother, Ltd. Certain 1-carbothioamides of 1,8-naphthyridines, pyrrolo(2,3-b)pyridines and pyrido(2,3-b)azepines. 3,960,876, Cl. 260-294.80C.

Curtiss-Wright Corporation: *See*—
Lamping, Harold D.; and Myers, David M., 3,960,115.

Cuscurida, Michael; and Austin, Thomas Howard, to Jefferson Chemical Company, Inc. Modified isocyanate foams. 3,960,788, Cl. 260-2.5AW.

Cutler-Hammer, Inc.: *See*—
Dummer, Merlin R., 3,961,146.
Halbeck, Werner B., 3,961,145.

Cutler, Ivan B., to University of Utah, The. Process for producing a solid solution of aluminum oxide in silicon nitride. 3,960,581, Cl. 106-65.000.

Cyphert, Gilbert G., to Chemko Industries, Inc. Carpet soil extractor. 3,959,844, Cl. 15-320.000.

Cyrenne, Henri-Paul. Combination flue gas scrubber and heat exchanger unit. 3,960,992, Cl. 261-152.000.

Czarnetzky, Edward J.: *See*—
Forest, Joseph G.; and Czarnetzky, Edward J., 3,961,092.

Dahlberg, Bengt Ingmar, to Alfa-Laval AB. Centrifugal separator. 3,960,318, Cl. 233-4.000.

Dai Nippon Insatsu Kabushiki Kaisha: *See*—
Suzuki, Kooji, 3,959,902.

Daido Metal Company, Ltd.: *See*—
Morisaki, Nobukazu, 3,961,258.

Daigle, Donald J.; Pepperman, Armand B., Jr.; and Vail, Sidney L., to United States of America, Agriculture. Treatment of organic textiles with adduct polymers and phenols. 3,961,110, Cl. 427-390.000.

Daikin Kogyo Co., Ltd.: *See*—
Kometani, Yutaka; Koizumi, Shun; Kubota, Kazuo; and Nawazima, Takeaki, 3,960,651.

Dailey, Lawrence W., to Societe Nationale des Petroles d'Aquitaine. Combined hydrolysis and absorption process and apparatus therefor. 3,961,015, Cl. 423-229.000.

Dailey, Leo L.: *See*—
Morrow, James J.; and Dailey, Leo L., 3,960,673.

Daimer, Wolfgang; and Dworak, Gert, to Vianova-Kunstharz A. G. Aqueous coating compositions comprising film-forming polyhydroxy component and polyvalent film-forming resin without polyelectrolyte character. 3,960,789, Cl. 260-21.000.

Daimler-Benz Aktiengesellschaft: *See*—
Neubrand, Franz, 3,960,209.
Perrin, Gunter, 3,960,122.

Dairylea Cooperative Inc.: *See*—
Jones, Calvin, 3,960,021.

Daley, Edwin W.; and Yowler, M. Pauline, to Procter & Gamble Company, The. Shampoo compositions which impart high luster and manageability to hair. 3,960,782, Cl. 252-544.000.

Daniel, Russell D.: *See*—
Beatty, Bobby D.; Daniel, Russell D.; Humerickhouse, Billy J.; and Norris, Gary G., 3,960,087.

Daniels, Phillip D. Screen and storm sash construction. 3,960,197, Cl. 160-371.000.

Danilewicz, John Christopher; Kemp, John Edward Glyn; and Wright, James Robert, to Pfizer Inc. 2 (or 4) Amino 4 (or 2) N-hetero quinazolines. 3,960,861, Cl. 260-256.40Q.

Danilewicz, John Christopher: *See*—
Cox, David Alexander; Danilewicz, John Christopher; Ham, Allan Leslie; Kemp, John Edward Glyn; and Snarey, Michael, 3,961,072.

Danly, Donald E.: *See*—
Campbell, Charles R.; Danly, Donald E.; and Mueller, Werner H., 3,960,679.

Danner, Kenneth H., to Rosemount Inc. Heated roll inductive heater construction. 3,961,151, Cl. 219-10.490.

Dansk Industri Syndikat A/S: *See*—
Jorgensen, Hemming Kristian, 3,960,202.

Dargitz, Arthur Z.; and Dargitz, Lawrence A. Dry wall taping device. 3,960,643, Cl. 156-390.000.

Dargitz, Lawrence A.: *See*—
Dargitz, Arthur Z.; and Dargitz, Lawrence A., 3,960,643.

Darsow, Gerhard; Schiller, Paul; Reese, Eckart; Bottenbruch, Ludwig; Binsack, Rudolph; Vernaleken, Hugo; and Wank, Joachim, to Bayer Aktiengesellschaft. Branched aromatic polyaryl-ether sulphones. 3,960,815, Cl. 260-49.000.

Dart Industries Inc.: *See*—
Kelley, Joseph M.; and Miskel, John J., Jr., 3,960,987.

Datametrics Corporation: *See*—
Walker, John A.; Dimitri, Dimitri S.; and Perkins, Reginald Louis, 3,961,336.

Daubach, Ewald; Saukel, Heinz; and Von Rambach, Leonhard, to BASF Aktiengesellschaft. Powdered, highly concentrated and stably dispersible dye formulations. 3,960,486, Cl. 8-79.000.

Davies, Phineas; and Hall, Alan James, to Imperial Chemical Industries Limited. Process for forming hydrogen and carbon dioxide using a catalyst consisting essentially of oxides of copper, zinc and aluminum or magnesium. 3,961,037, Cl. 423-656.000.

Davies, Terrence Ardern, to Square D Company. Electrical contact materials and methods of making the same. 3,960,553, Cl. 75-173.00R.

Davis, Bill G., to Jetco, Inc. Internal combustion engine starting system. 3,960,131, Cl. 123-187.50R.

Davis, Charles Alfred: *See*—
Benda, David; and Davis, Charles Alfred, 3,961,221.

Davis, Clark W., to National Semiconductor Corporation. CMOS differential amplifier circuit utilizing a CMOS current sinking transistor which tracks CMOS current sourcing transistors. 3,961,279, Cl. 330-30.00D.

Davis, John King; and Fernald, Henry Grant, to American Optical Corporation. Ophthalmic lens series. 3,960,442, Cl. 351-176.000.

Davis, Lyle W. Weighted picnic table cloth. 3,960,193, Cl. 150-52.00R.

Davis, Pauls; Vogt, Herwart C; and Deck, Charles F., to BASF Wyandotte Corporation. Crosslinking polymers with chloronitroso compounds. 3,960,822, Cl. 260-79.50P.

Davis, Pauls: *See*—
Vogt, Herwart C.; Deck, Charles F.; and Davis, Pauls, 3,960,821.

Davis, Richard W.; and Muir, Thomas L., to Villa Precision, Inc. Frame for supporting frangible sheet materials. 3,960,268, Cl. 206-45.330.

Davis, Ross Alan. Radio frequency transformer. 3,961,292, Cl. 333-32.000.

Davis, Ross Alan. Antenna system utilizing currents in conductive body. 3,961,330, Cl. 343-712.000.

Davis, Royston H.; and Searle, Robert J. G., to Shell Oil Company. Pesticidal dihalovinyl-spiroalkanecyclopropane derivatives. 3,961,070, Cl. 424-304.000.

Davy, Duncan Clement. Trimarans. 3,960,102, Cl. 114-123.000.

Dawson, John M., to United States of America, Energy Research and Development Administration. X-ray generator. 3,961,197, Cl. 250-493.000.

Dawson, Samuel G.: *See*—
Fowler, Charles F.; and Dawson, Samuel G., 3,959,948.

Dawson, Stanford, to Lawrence Peska Associates, Inc., a part interest. Flying toy. 3,959,917, Cl. 46-74.00D.

De Brem, Francois Regis Marcetteau; and Waroux, Maurice Denis, to Gaz de France. System for remote reading of indicating devices such as meters and the like. 3,961,317, Cl. 340-188.00R.

De Brey, Robert J. Particle flow monitor. 3,960,106, Cl. 116-67.00R.

Deck, Charles F.: *See*—
Davis, Pauls; Vogt, Herwart C; and Deck, Charles F., 3,960,822.
Vogt, Herwart C.; Deck, Charles F.; and Davis, Pauls, 3,960,821.

Decker, Peter: *See*—
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Decoflex Limited: *See*—
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Deering Milliken Research Corporation: *See*—
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Deininger, Kurt: *See*—
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Dejima, Shigeo: *See*—
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Del Norte Technology, Inc.: *See*—
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DeLigt, John; and Nikkel, Willem A., to Westvaco Corporation. Angular indexing mechanism. 3,960,475, Cl. 425-505.000.

Dell'Acqua, Ernani; and Ferrari, Rodolfo, to SPA-Societa prodotti Antibiotici S.p.A. Water-solubilized antibiotics. 3,961,048, Cl. 424-122.000.

DeLong, David C. Bench seat with end aligning and reinforcing insert. 3,960,405, Cl. 297-248.000.

DeLuca, Paul V.; and Carney, William V., to Porta Systems Corporation. Telephone connector block. 3,961,227, Cl. 317-101.00R.

De Marinis, Robert M.; and Hoover, John R. E. Substituted sulfonylacetamido cephalosporins. 3,960,852, Cl. 260-243.00C.

De Marinis, Robert M.; and Hoover, John R. E., to SmithKline Corporation. Substituted sulfonylacetamido cephalosporins. 3,960,853, Cl. 260-243.00C.

De Marinis, Robert M.; and Hoover, John R. E., to SmithKline Corporation. Substituted sulfonylacetamido cephalosporins. 3,960,855, Cl. 260-243.00C.

Denis, Joseph Herbert; and Rodolitz, Abraham J. Refrigeration unit. 3,959,982, Cl. 62-223.000.

Denson, Donald Derby: *See*—
Story, Paul Richard; Busch, Peter; Denson, Donald Derby; and Wright, Carl Edward, 3,960,897.

Derighetti, Renato: *See*—
Ullmann, Werner; Derighetti, Renato; and Gagliati, Umberto, 3,961,270.

De Sandre, Giovanni; Subrizi, Angelo; and Bretti, Franco, to Ing. C. Olivetti & C., S.p.A. Fixed point to floating point conversion in an electronic computer. 3,961,170, Cl. 235-154.000.

Design and Manufacturing Corporation: *See*—
Yake, William H.; and Wallace, Donald G., 3,960,290.

DeSimone, Robert S., to Rhodia, Inc. Process for the preparation of α,β-unsaturated nitriles. 3,960,923, Cl. 260-465.900.

Detroit Edison Company, The: *See*—
Brokenshire, Robert E.; and Pratt, Robert G., 3,961,185.

Deubel, Reinhold; Hemmerling, Volker; Reitz, Werner; and Teige, Wolfgang, to Hoechst Aktiengesellschaft. Process for the preparation of pigment compositions for the dope dyeing of polyacrylonitrile. 3,960,591, Cl. 106-308.00M.

Deutsche Gold- und Silber-Scheideanstalt vormals Roessler: *See*—
Beschke, Helmut; Schaefer, Hans; Schreyer, Gerd; Schuler, Wilhelm Alfons; and Weigert, Wolfgang, 3,960,766.
Geiger, Friedhelm; Heimberger, Werner; Schreyer, Gerd; and Weigert, Wolfgang, 3,961,023.

Deutsche Texaco Aktiengesellschaft: *See*—
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Deutsches Brennstoffinstitut Freiberg: *See*—
Hubner, Wolfgang; and Fasshauer, Wilhelm, 3,960,394.

Deutschlander, Gert, to S I G Schweizerische Industrie-Gesellschaft. Packaging apparatus using hose-shaped wrapper. 3,959,952, Cl. 53-373.000.

Develpro Incorporated: *See*—
Dutchburn, Leslie G., 3,960,067.

Dewitt, Ivan L.; and Pacanowsky, Eugene, to Thiokol Corporation. Process for the manufacture of oxalyl dihydrazide and the use of same as a coolant in gas generating compositions. 3,960,946, Cl. 260-561.00H.

Dexter Corporation, The: *See*—
Conway, Bernard W.; and Moran, James, 3,960,652.

Di Antonio, Daniel Joseph, to Litton Systems, Inc. Adapter bushing for lubrication system. 3,960,243, Cl. 184-6.000.

Dickler, Paul J. Tamper-proof backpack. 3,960,300, Cl. 224-8.00R.

Dicks, Mason L.; and Morrow, James B., to Hanna Mining Company, The. Cationic froth flotation process. 3,960,715, Cl. 209-166.000.

Dielacher, Maximilian; and Hansen, Uwe, to Deutsche Texaco Aktiengesellschaft. Process for the purification of slack waxes. 3,960,703, Cl. 208-26.000.

Dietrich, Paul; and Sundt, Erling, to Firmenich S.A. Flavoring agents comprising unsaturated butyrolactone derivatives and precursors thereof. 3,961,094, Cl. 426-536.000.

Dietzel, Russel W.; and Leslie, William B., to United States of America, Energy Research & Development Administration. Igniter containing titanium hydride and potassium perchlorate. 3,960,083, Cl. 102-28.00R.

Digital Equipment Corporation: *See*—
Bickoff, Charles; and Hall, St. John Merrill, Jr., 3,960,256.

DiGiulio, Walter, to Nuclear Diagnostics, Inc. Method for determining an index of binding protein content of blood. 3,960,492, Cl. 23-230.00B.

Dilanni, Daniel: *See*—
Brackmann, Warren A.; and Dilanni, Daniel, 3,960,645.

DiMaio, Vincent, to Structural Plastics Incorporated. Method of making resin impregnated glass fiber article. 3,961,012, Cl. 264-257.000.

Dimensional Development Corporation: *See*—
Lo, Allen Kwok Wah; and Nims, Jerry Curtis, 3,960,563.

Dimitracopoulos, Panayotis C. Internal combustion engine. 3,960,119, Cl. 123-32.00C.

Dimitri, Dimitri S.: *See*—
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Director-General of the Agency of Industrial Science and Technology: *See*—
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Discojet Corporation: *See*—
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Dmitriev, Vladimir Alexandrovich: *See*—
Levin, Felix Lvovich; Golovanenko, Sergei Alexandrovich; Pridantsev, Mikhail Vasilievich; and Dmitriev, Vladimir Alexandrovich, 3,960,617.

Dobbins, Thomas Edward, to American Can Company. Carton with inspection flap and blank therefor. 3,960,315, Cl. 229-87.00F.

Dobias, Robert M.; Kmetz, Tibor; and Warnell, Walter C., to National Can Corporation. Can trimming apparatus. 3,960,099, Cl. 113-7.00R.

Dodds, Philip John: *See*—
Hutt, Peter Richard; Blake, Alan Ronald; von Cavallar, Gunter; Douglas, Brian Neil; and Dodds, Philip John, 3,961,137.

Dogliotti, Amilcare, to P. Ferrero & C. S.p.A. Method of manufacture of hollow chocolate articles. 3,961,089, Cl. 426-274.000.

Dohling, Jerome: *See*—
Clovis, James S.; and Dohling, Jerome, 3,960,671.

Dokoshi, Noriaki: *See*—
Yoda, Naoya; Yoshi-i, Toshiya; Fujita, Saburo; Mochizuki, Hiroshi; Yumoto, Hirosuke; Kurihara, Masaru; Kubota, Takashi; Dokoshi, Noriaki; and Tanaka, Chiaki, 3,961,009.

Dokunikhin, Nikolai Stepanovich; and Vorozhtsov, Georgy Nikolaevich. Method of producing perylenetetracarboxylic acid derivatives. 3,960,867, Cl. 260-281.00P.

Doll & Co.: *See*—
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Domange, Jean-Louis: *See*—
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Dominion Engineering Works, Limited: *See*—
Futcher, Ralph James; and Malashenko, Alexander, 3,960,653.

Domyan, Frank F., to International Telephone and Telegraph Corporation. Ball valve. 3,960,363, Cl. 251-174.000.

Donley, Miller & Nowikas: *See*—
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Donovan, James W., to Nace, Barry J., a part interest. Fuel saving apparatus. 3,960,133, Cl. 123-198.00R.

Dooley, Andrew Philip Charles: *See*—
MacKenzie, Morley Scott; Charron, Louis Donald; Dooley, Andrew Philip Charles; and Lee, John Davidson, 3,960,431.
Dorheim, David W.: *See*—
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Doss, James D.; and McCabe, Charles W., to United States of America, Energy Research and Development Administration. Differential temperature integrating diagnostic method and apparatus. 3,960,138, Cl. 128-2.00H.
Douglas, Brian Neil: *See*—
Hutt, Peter Richard; Blake, Alan Ronald; von Cavallar, Gunter; Douglas, Brian Neil; and Dodds, Philip John, 3,961,137.
Douthat, Dean Z.: *See*—
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Raley, Charles F., Jr.; and Asher, Delman R., 3,960,770.
Rubens, Louis C., 3,960,784.
Savage, Albert B., 3,960,584.
Dow Corning Corporation: *See*—
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Lee, Kenneth M., 3,960,574.
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Dow Corning Limited: *See*—
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Dowa Co., Ltd.: *See*—
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Dowbenko, Rostyslaw; and Marchetti, Joseph R., to PPG Industries, Inc. Hydrolyzed reaction product of a polyepoxide with a phenolic compound having a group hydrolyzable to carboxyl. 3,960,795, Cl. 260-29.2EP.
Downing, John Kenneth, to Vent Axia Limited. Improvements in and relating to fans. 3,960,464, Cl. 415-146.000.
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Doyle, Natividad F. Game apparatus. 3,960,377, Cl. 273-1.00R.
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Drawe, William A., to Xerox Corporation. Color highlighting electrophotographic printing machine. 3,960,445, Cl. 355-4.000.
Dreier, Gustav H.: *See*—
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Dresser Industries, Inc.: *See*—
Abney, Dave L.; Williams, Robert C.; and Gilbert, Horace E., 3,960,366.
Jett, Marion Barney; Jackson, Jay Warner; and Irby, Richard Eugene, 3,960,015.
Drose, Georg: *See*—
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Dryden, Gale E. Apparatus for high flow anesthesia. 3,960,148, Cl. 128-188.000.
Du Pont of Canada Limited: *See*—
Pinney, Baden McDowall, 3,960,820.
Dubot, Guy; and Lemercier, Jacques, to Fabrique d'Horlogerie la Vedette S.A. Light-responsive electric switch. 3,961,183, Cl. 250-214.00R.
Ducan, Lane S.; Tamny, Simon Z.; and Riedy, Charles H., to Nordson Corporation. Powder spray system. 3,960,323, Cl. 239-3.000.
DuCharme, Donald W., to Upjohn Company, The. Substituted morpholine guanidines for the treatment of arrhythmic conditions. 3,961,056, Cl. 424-248.000.
Duchmann, Gail E.: *See*—
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Dudziak, Ernst: *See*—
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Duerr, Dieter; and Pissiotas, Georg, to Ciba-Geigy Corporation. Condensation products. 3,960,947, Cl. 260-561.00R.
Dufrene, Alex. Setting and retrieval device for down-hole equipment. 3,960,399, Cl. 294-86.250.
Dugan, Virgil H. Precision mobile gravity survey and guidance system. 3,960,344, Cl. 244-182.000.
Dummer, Merlin R., to Cutler-Hammer, Inc. Pretravel switch for portable tools. 3,961,146, Cl. 200-157.000.
Dumont, Louis Claude; Paris, Rene Antoine; and Scharff, Claude Mathilde, to PEPRO, Societe pour le Developpement et la Vente de Specialites Chimiques. Antichlorosis compositions for plants. 3,960,536, Cl. 71-1.000.
Dunn, Wendell E., Jr., to Titanium Technology N.V. Fluidized bed cooler. 3,960,203, Cl. 165-1.000.
Du Pont de Nemours, E. I., and Company: *See*—
Bouchard, Robert Joseph; and Rogers, Donald Burl, 3,960,778.
Boyle, Edward Michael Joseph; and Johnson, Melvin Harry, 3,960,305.
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Kohan, Melvin Ira, 3,960,984.
Uyeda, Roy Teruyuki, 3,960,956.
Duranleau, Roger G.; and Larkin, John M., to Texaco Inc. Preparation of acylhydroximyl halides. 3,960,953, Cl. 260-566.00A.
Dusenberry, William L. Silver recovery process. 3,960,550, Cl. 75-118.00P.
Dutchburn, Leslie G., to Develpro Incorporated. Counterbalance for rotary spit. 3,960,067, Cl. 99-421.00H.
Dute, John C. Apparatus for constructing control circuits having relay circuit functional characteristics. 3,961,200, Cl. 307-112.000.
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Ebeling, Harold O.; and McMinn, Robert E., to Black, Sivalls & Bryson, Inc. Method and system for generating a dehydrated inert gas stream. 3,960,519, Cl. 55-31.000.
Eberl, James Joseph; Thelen, Edmund; and Heller, Harold L., to Certain-teed Products Corporation. Method for the manufacture of coated calcium sulfate whisker fibers. 3,961,105, Cl. 427-220.000.
Echterling, Hubert H. Newspaper arrival indicators. 3,960,316, Cl. 232-1.00C.
Ecology Controls, Inc.: *See*—
Sleeper, David P., 3,960,237.
Economic Laboratories, Inc.: *See*—
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Edamura, Fred Y., to Dow Chemical Company, The. 6-(Substituted phenoxy)tetrazolo(1,5-b)pyridazines and a method of use for control of soil-borne plant diseases. 3,961,059, Cl. 424-250.000.
Eddy, William C., to Aspro, Incorporated. High-low tire pressure signal switch. 3,961,309, Cl. 340-58.000.
Eder, Ulrich: *See*—
Haffer, Gregor; Eder, Ulrich; Laurent, Henry; Ruppert, Jurgen; Sauer, Gerhard; and Wiechert, Rudolf, 3,960,842.
Edmiston, Glen P. Trolling depthometer. 3,959,885, Cl. 33-126.000.
Edwards, Preston G., to General Electric Company. Sheet metal base for pinch sealed electric lamp. 3,961,216, Cl. 313-51.000.
Ehlert, Delbert D. Rope hook mount for a vehicle or the like. 3,960,091, Cl. 105-475.000.
Eibl, Hansjorg; and Nicksch, Alfar, to Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V. Diacylglycerophosphoric acid esters of aminoethanol and methylaminoethanol and method of preparing the same. 3,960,905, Cl. 260-403.000.
Eichamer, Paul D.: *See*—
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Eichelberger, Edward B., to International Business Machines Corporation. Testing embedded arrays. 3,961,252, Cl. 324-73.0AT.
Eichinger, Johann, to Carl Hurth, Maschinen- und Zahnradfabrik. Gear drive. 3,960,029, Cl. 74-413.000.

Eickmann, Karl. Pressure responsive control body arrangement. 3,960,060, Cl. 91-487.000.
Eisai Co., Ltd.: *See—*
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Elks, Joseph; Weir, Niall Galbraith; Gane, Timothy Larry; and Burton, Brian, to Glaxo Laboratories Limited. Process for the preparation of D(−)-penicillamine and salts thereof. 3,960,940, Cl. 260-534.00S.
Ellcon-National, Inc.: *See—*
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Elliott, Stanley E.; and Shore, Jack H., to Institutes of Medical Sciences, The. Air flow to pressure differential transducer for pneumotachography. 3,960,142, Cl. 128-2.080.
Ellis, Michael C.; and Manning, Harold E., to Petro-Tex Chemical Corporation. Lithium promoted magnesium chromite dehydrogenation catalysts. 3,960,776, Cl. 252-465.000.
Elliston, Thomas L., to Elliston, Thomas L. Internally pressurized load supporting mast. 3,960,360, Cl. 254-139.100.
Elstow, William Rupert Brooke; and Jennings, David Michael, to Pains-Wessex Limited. Marine smoke markers. 3,961,259, Cl. 325-66.000.
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Emanuel, Mary Victoria, to Boeing Company, The. Conservation and conversion of poultry waste products. 3,961,096, Cl. 426-644.000.
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Emodi, Alexander, to Hoffmann-La Roche Inc. Juvenile hormones stabilized with acrylonitrile U.V. absorbers. 3,961,051, Cl. 424-174.000.
Encinas, Jean, to U.S. Philips Corporation. Integrated circuit having bipolar transistors and method of manufacturing said circuit. 3,961,340, Cl. 357-40.000.
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Energy Conversion Devices, Inc.: *See—*
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Engel, Klaus; Prezewowsky, Klaus; Laurent, Henry; and Nishino, Yukishige, to Schering Aktiengesellschaft. 3,17,18-Trihydroxy-1,3,5(10)-estratrienes. 3,960,841, Cl. 260-239.55R.
Engelhardt, Albrecht: *See—*
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Ericsson, Rolf, to Elektriska Svetsningsaktiebolaget. Direct current power supply for manual arc welding. 3,961,154, Cl. 219-135.000.
Erlandson, Paul M., to Continental Can Company, Inc. Method of fabricating tubular bodies. 3,960,624, Cl. 156-69.000.
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Eschenbach, Paul W., to Deering Milliken Research Corporation. Circular knitting machine with attached stool member. 3,959,992, Cl. 66-8.000.
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Ester, Wilhelm, deceased (by Ester, Margarete, nee Berkemann, heir); by Lovis, Brigitte, nee Ester, heir; by Ester, Wolfgang, heir; and Heitmann, Wilhelm, to Veba-Chemie AG. Continuous distillation process for purifying alkanols. 3,960,672, Cl. 203-37.000.
Ester, Wolfgang, heir: *See—*
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Wiegand, Karl E., 3,960,941.
Ettenberg, Michael, to RCA Corporation. Method of making a transmission mode semiconductor photocathode. 3,960,620, Cl. 148-175.000.
Evans, James D.; and Long, William R., Jr., to Armco Steel Corporation. Rare earth metal treated cold rolled, non-oriented silicon steel and method of making it. 3,960,616, Cl. 148-111.000.
Evans, John L.: *See—*
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Evers, William J.; Heinsohn, Howard H., Jr.; Mayers, Bernard J.; and Karoll, Elizabeth A., to International Flavors & Fragrances Inc. Novel flavoring compositions and products containing 2-methyl-3-thio-(2-methylbutyryl)-furan. 3,961,093, Cl. 426-535.000.
Evers, William J.: *See—*
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Fairchild Camera and Instrument Corporation: *See—*
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Fake, Charles Sylvester, to Beecham Group Limited. Non-toxic ADL antihypertensives. 3,960,879, Cl. 260-297.00B.
Fake, Charles Sylvester, to Beecham Group Limited. Tetrahydropyrid-4-yl-chroman-5-ol derivatives. 3,960,880, Cl. 260-295.00F.
Fallon, Herbert J., to Bendix Corporation, The. Clamping fixture for a double disc grinder. 3,959,933, Cl. 51-217.00R.
Fanti, Joel; and Martins, Joseph G., to Monsanto Company. Process for recovery and reuse of textile size. 3,960,485, Cl. 8-138.000.

Farha, Floyd, Jr.: *See*—
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Farrand, Robert W.; and Elbling, Joseph, to Inductosyn Corporation. Electrostatic position-measuring transducer. 3,961,318, Cl. 340-200.000.

Farrenkothen, Armin: *See*—
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Farrow, Harold Frederick; and Rackstraw, Bernard Booth, to Encoline(Process)Limited. Printing processes. 3,960,078, Cl. 101-150.000.

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Faure, Jacqueline; Malmejac, Yves; and Schaub, Bernard, to Commissariat a l'Energie Atomique. Method of growing single crystals. 3,960,647, Cl. 156-603.000.

Fazakerley, Stanley, to British Petroleum Company Limited, The. Treatment of proteinaceous material. 3,960,659, Cl. 195-5.000.

Fechter, Willy: *See*—
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Fedorov, Valery Ionovich: *See*—
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Fegeat, Antoine Gabriel (dit Tony). Circular pile fabric knitting machines. 3,959,993, Cl. 66-9.00B.

Feinauer, Roland: *See*—
Magosch, Karl Heinz; Feinauer, Roland; and Ruter, Jorn, 3,960,686.

Feinberg, Jacob Howard, to American Can Company. Sulfones as solvents in catalysts of U.V. curable systems. 3,960,684, Cl. 204-159.110.

Feist, Wolfgang M., to Raytheon Company. Thin film dielectric storage target and method for making same. 3,960,562, Cl. 96-38.000.

Feiten, Karl-Josef: *See*—
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Feldman, Ernst Borisovich: *See*—
Butuzov, Vladimir Petrovich; Vatolkin, Evgeny Konstantinovich; Gordienko, Leonid Alexandrovich; Feldman, Ernst Borisovich; Khadzhi, Valentin Evstafievich; and Shaposhnikov, Anatoly Alexandrovich, 3,960,501.

Feldman, Harold: *See*—
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Fellinger, Frank, to North Electric Company. Asynchronous bit-serial data receiver. 3,961,138, Cl. 178-69.50R.

Femmer, Klaus: *See*—
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Fergason, James L., to International Liquid Xtal Company. Liquid-crystal mixtures for use in liquid-crystal displays. 3,960,749, Cl. 252-299.000.

Fernald, Henry Grant: *See*—
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Ferodo Limited: *See*—
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Ferrari, Rodolfo: *See*—
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Ferrini, Pier Giorgio; Haas, Georges; and Rossi, Alberto, to Ciba-Geigy Corporation. Derivatives of 6,7 or 8 cycloalkyl 4-oxo quinoline 3 carboxylic acid. 3,960,868, Cl. 260-287.0AN.

Fial, Ronald Augustine; and Markowtiz, Hal, to Portland Zoological Society. Audio information device. 3,960,254, Cl. 194-9.00T.

Fieldhouse, Roger, to Foseco Trading A.G. Expansible frame hot topping apparatus with wedge insertion means. 3,960,199, Cl. 164-339.000.

Filatov, Nikolai Grigorievich; Gridnev, Vitaly Nikiforovich; Gavriljuk, Valentin Gennadievich; Meshkov, Jury Yakovlevich; Mashlenko, Felix Isaakovich; Mikhailov, Konstantin Vasilievich; Fedorov, Valery Ionovich; Marchenko, Vladimir Zakharovich; Lyskov, Ivan Konstantinovich; and Budilovsky, Viktor Alexandrovich, to Lyskov, Ivan Konstantinovich; and Budilovsky, Viktor Alexandrovich. Method of producing long-length articles from hot-rolled carbon steel and article produced thereby. 3,959,999, Cl. 72-364.000.

Filippi, Ernest A.: *See*—
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Filippov, Vladimir Vasilievich: *See*—
Zavyalov, Sergei Ivanovich; Rodionova, Natalya Alexandrovna; Parnes, Zinaida Naumovna; Bolestova, Galina Ilinichna; Filippov, Vladimir Vasilievich; and Zheleznaya, Lidia Lvovna, 3,960,884.

Firestone Tire & Rubber Company, The: *See*—
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Fisch, Richard S.; and Newman, Norman, to Minnesota Mining and Manufacturing Company. Silver bleaching solutions. 3,960,565, Cl. 96-60.00R.

Fischer, Adolf: *See*—
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Fischer, Artur. Connector for elements made of structural foam. 3,960,460, Cl. 403-292.000.

Fischer & Porter Co.: *See*—
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Fisher Controls Company: *See*—
Hargrave, Michael E., 3,960,364.

Fisher, Elliott. Spring power device. 3,960,246, Cl. 185-40.00H.

Fisher, Evan D., to United States of America, Army. Air valve safety device for bomb fuzes. 3,960,086, Cl. 102-70.20G.

Fisher, Robert C. Shoulder strap bracket. 3,959,855, Cl. 24-163.0FC.

Fisher, Robert C. Seat belt retractor. 3,960,339, Cl. 242-107.40R.

Flamand, Maurice, to Rockwell International Corporation. Interchangeable weft carrier. 3,960,183, Cl. 139-447.000.

Flament, Ivon: *See*—
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Fleck, Wolfgang: *See*—
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Fleischmann, Johann R.; Fechter, Willy; and Schmidt, Heinrich, to Doll & Co. Device for precision grinding and polishing of workpieces. 3,959,929, Cl. 51-68.000.

Fletcher, Gerald William. Ski lock. 3,959,995, Cl. 70-18.000.

Flint, Alan G. Mask plate handling apparatus. 3,960,277, Cl. 214-1.0BH.

Flora, Laurence Paul, to Burroughs Corporation. Oscillator control circuit. 3,961,284, Cl. 331-116.00R.

Fluid Power Research, Inc.: *See*—
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Forenade Fabriksverken: *See*—
Svensson, Sven Torsten Arnold; and Bjelvert, Sven William, 3,960,453.

Forest, Joseph G.; and Czarnetzky, Edward J. Method for preserving high moisture content agricultural grains. 3,961,092, Cl. 426-331.000.

Formica Corporation: *See*—
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Forney Engineering Company: *See*—
Slater, Billy Ray, 3,960,320.

Forster, Werner: *See*—
Braun, Klaus; Gabsch, Gunther; Forster, Werner; Ertel, Rolf; and Femmer, Klaus, 3,960,859.

Forsyth, Robert P.; and Rose, Gilbert A., Sr., to Polaroid Corporation. Accessory mounting adaptor for photographic apparatus. 3,961,349, Cl. 354-295.000.

Fort, Jean-Paul; and Michel, Max, to Rhone-Progil. Agglomerated alumina-based spherical grains. 3,960,772, Cl. 252-455.00R.

Foseco Trading A.G.: *See*—
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Foster, Samuel L.: *See*—
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Pataki, Zsuzsa, nee Nagy; Windisch, Ferenc; Nagy, Jozsef; Kecskemethy, Geza; and Virag, Gyorgy, 3,960,630.

Fowler, Charles F.; and Dawson, Samuel G. Method of placing a sterilized sheath on a probe. 3,959,948, Cl. 53-35.000.

Fowler, Donald W.; and O'Connor, Sean J., to United Technologies Corporation. Aerodynamic surface control feel augmentation system. 3,960,348, Cl. 244-83.00D.

Fowler, Gordon Arthur: *See*—
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Fowler, Lambuth G. Cotton harvesting machine. 3,959,956, Cl. 56-30.000.

Fozzard, George B.: *See*—
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Fracchia, Alfred Andrew: *See*—
Carey, Jane Towne; and Fracchia, Alfred Andrew, 3,960,153.

Fraioli, Anthony V., to Plessey Incorporated. Humidity sensor. 3,961,301, Cl. 338-35.000.

Franz Muller Maschinenfabrik: *See*—
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Fraser, Harvey R., Jr.: *See*—
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Frederick, Carlton L.: *See*—
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Free, Dustin L.; Krumel, Karl L.; and Snyder, Travis C., to Dow Chemical Company, The. Self-breaking viscous aqueous solutions and the use thereof in fracturing subterranean formations. 3,960,736, Cl. 252-8.55R.

Freeman, Jacob J., to United States of America, Navy. Method of obtaining correlation between certain selected samples of a sequence. 3,961,171, Cl. 235-181.000.

Freeman, Leo B., Jr.: *See—*
Abbas, Shakir A.; Chang, Chi S.; Freeman, Leo B., Jr.; and Knepper, Ronald W., 3,961,355.

Freeport Minerals Company: *See—*
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Freis, Richard E.; and Rue, Larry M., to Economic Laboratories, Inc. Isocyanate-capped surface active compositions and methods of using them. 3,960,781, Cl. 252-541.000.

Freund, Thomas: *See—*
Morrison, Stanley Roy; and Freund, Thomas, 3,960,589.

Fridlyander, Iosif Naumovich; Yatsenko, Konstantin Petrovich; Nekrasova, Galina Anatolievna; Gulin, Alexandr Nikolaevich; Semenova, Zoya Grigorievna; Sidorov, Nikolai Grigorievich; Morozov, Boris Sergeevich; Krichevsky, Efrem Julievich; Zakharova, Tatyana Alexandrovna; and Sarycheva, Raisa Grigorievna. Aluminium based alloy. 3,960,551, Cl. 75-147.000.

Fried, John H.; and Harrison, Ian T., to Syntex Corporation. Naphthyl substituted aliphatic acids. 3,960,936, Cl. 260-488.0CD.

Fried. Krupp Gesellschaft mit beschrankter Haftung: *See—*
Brandis, Curt; and Muller, Peter, 3,961,006.

Fried. Krupp Huttenwerke AG: *See—*
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Friederang, Albrecht: *See—*
Pasedach, Heinrich; and Friederang, Albrecht, 3,960,970.

Frischer, Myles E., to Burroughs Corporation. Gaseous discharge display panel having two color bar display. 3,961,217, Cl. 313-188.000.

Frisons Limited: *See—*
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Fritz Buser AG Maschinenfabrik: *See—*
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Fritz, Dieter: *See—*
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Fritz, Heinz Peter; and Besenhard, Jurgen, to Rheinisch-Westfalisches Elektrizitatswerk Aktiengesellschaft. Primary or secondary electrochemical cell. 3,960,594, Cl. 136-6.0LN.

Frochaux, Alain; and Salerno, Charles M., to Barry Wright Corporation. Noise-reducing fluid-flow devices. 3,960,239, Cl. 181-49.000.

Frohner, Maria: *See—*
Mayr, Hubert; Presoly, Elfriede; Weinrotter, Ferdinand; Muller, Walter; Stern, Gerhard; and Frohner, Walter Mizzi, deceased, 3,960,541.

Frohner, Walter Mizzi, deceased: *See—*
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Frost, Donald J., to Modine Manufacturing Company. Method of making a heat exchanger and the heat exchanger. 3,959,867, Cl. 29-157.3AH.

Fuchs, Werner; Platz, Rolf; and Vogt, Volker, to BASF Aktiengesellschaft. Manufacture of organic isocyanates. 3,960,916, Cl. 260-453.0PH.

Fuji Photo Film Co., Ltd.: *See—*
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Ikenoue, Shinpei; and Masuda, Takao, 3,960,566.
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Fujita, Shigemi: *See—*
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Fukai, Masakazu: *See—*
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Moriyama, Akio; Fukai, Masakazu; Tatsuta, Hiroshi; and Takahashi, Hiroaki, 3,960,751.

Fukuda, Nobuyoshi. Packaging system. 3,959,950, Cl. 53-37.000.

Fukui, Jun: *See—*
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Fukui, Yoshiharu: *See—*
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Fukumaru, Toshitsugu; Kobayashi, Kenji; Mizote, Hiroyuki; Inaba, Shigeho; and Yamamoto, Hisao, to Sumitomo Chemical Company, Limited. 6,7-Benzomorphan derivatives. 3,961,066, Cl. 424-267.000.

Fukuoka, Kenji, to Olympus Optical Co., Ltd. Image information transfer device. 3,961,165, Cl. 235-92.0SH.

Fukuroi, Takeo, to Yoshida Kogyo Kabushiki Kaisha. Bridge top stop for slide fasteners. 3,959,858, Cl. 24-205.11F.

Fukushima, Mitsuru: *See—*
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Furihata, Makoto: *See—*
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Furst, Marcel, to American Videonetics Corporation. Tape transport apparatus. 3,960,342, Cl. 242-192.000.

Furuta, Akihiro: *See—*
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Futcher, Ralph James; and Malashenko, Alexander, to Dominion Engineering Works, Limited. Downflow control system for web making machines. 3,960,653, Cl. 162-264.000.

Fuxe, Kjell Gunnar, to Astra Lakemedal Aktiebolag. Method and compositions for the treatment of neurological disorders. 3,961,060, Cl. 424-253.000.

G. D. Searle & Co.: *See—*
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G. Siempelkamp and Co.: *See—*
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G & W Electric Specialty Company: *See—*
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Gabrail, Sami I., to General Electric Company. Etchant for removing metals from glass substrates. 3,960,741, Cl. 252-79.300.

Gabsch, Gunther: *See—*
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Gaenzler, Wolfgang; Kabs, Klaus; and Schroeder, Guenter, to Rohm GmbH. Method for the oxycarbonylation of ethylene and propylene. 3,960,934, Cl. 260-484.00R.

Gaffney, John Marshall, to Harris-Intertype Corporation. Sheet delivery system. 3,960,374, Cl. 271-189.000.

Gaffney, Thomas David, to Oeleq Limited. Computer with manual parameter entry means. 3,961,168, Cl. 235-152.000.

Gagliati, Umberto: *See—*
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Gaidis, James M.: *See—*
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Gainer, Robert E., Jr., to Westinghouse Electric Corporation. Powdered metallurgical process for forming vacuum interrupter contacts. 3,960,554, Cl. 75-200.000.

Gaines, Donald R.; and Jelenic, Bronko F., to Gulf & Western Manufacturing Company (Michigan). Wear indicator for ball joints. 3,960,457, Cl. 403-27.000.

Gaines, George L., Jr.; and LeGrand, Donald G., to General Electric Company. Thin polymer films and method. 3,961,122, Cl. 428-220.000.

Gaines, Jerome; and Conrad, Herbert M., to Veriprint Systems Corporation. Method of preparing a dispensing pad for fingerprinting reagents. 3,960,632, Cl. 156-245.000.

Galantay, Eugene E.; and Habeck, Dietmar A., to Sandoz, Inc. Substituted carbinol derivatives. 3,961,053, Cl. 424-243.000.

Gale, Richard M.; Higgens, Calvin E.; and Hoehn, Marvin M., to Eli Lilly and Company. Antibiotic A23187 and process for preparation thereof. 3,960,667, Cl. 195-80.00R.

Gallo, Charles F., Jr., to Xerox Corporation. Sodium vapor lamp configuration. 3,961,222, Cl. 315-49.000.

Gane, Timothy Larry: *See—*
Elks, Joseph; Weir, Niall Galbraith; Gane, Timothy Larry; and Burton, Brian, 3,960,940.

Gano, John W., to Warner & Swasey Company, The. Material handling apparatus. 3,960,285, Cl. 214-141.000.
Gansauge, Peter: *See—*
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Gantley, Francis C., to General Electric Company. Membrane mask for selective semiconductor etching. 3,960,623, Cl. 156-16.000.
Gappa, Gunther: *See—*
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Gardiner, Robert F.: *See—*
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Gardner, Josef M.: *See—*
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Garey, Robert B., to Subsea Equipment Associates Limited. Self-engaging and aligning shaft coupling. 3,959,987, Cl. 64-8.000.
Garrott, William L., to Sperry Rand Corporation. Apparatus to detect the passage of ferrous material in crop harvesting machines. 3,959,953, Cl. 56-10.200.
Garshelis, Ivan J. Electromagnetic anisotropic devices. 3,961,297, Cl. 335-3.000.
Garton Company: *See—*
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Garwood, William E.; and Wise, John J., to Mobil Oil Corporation. Conversion of foots oil to lube base stocks. 3,960,705, Cl. 208-111.000.
Gaskell, Colin Simister; and O'Brien, Rory Morgan, to Alfred Herbert Limited. Light-emitting semiconductor display apparatus for displaying a band representation of a voltage analog of a measured parameter. 3,961,256, Cl. 324-96.000.
Gassman, Paul G.; and Gruetzmacher, Gordon D., to Ohio State University Research Foundation, The. Process for preparing azasulfonium halide salts. 3,960,926, Cl. 260-470.000.
Gassmann, Gerhard-Gunter, to International Standard Electric Corporation. FM receiver and demodulation circuit. 3,961,262, Cl. 325-345.000.
Gasson, Edward James; Krosnar, Thomas Charles; and Marrian, Stanley Frederic, to BP Chemicals International Limited. Production of acrylonitrile by ammoxidation of propylene. 3,960,925, Cl. 260-465.300.
Gates, Walter C., Jr.: *See—*
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Gatti, Raimondo; and Gierse, Franz Josef, to Franz Muller Maschinenfabrik. Method and apparatus for stabilizing a longitudinally moving web of material. 3,960,303, Cl. 226-1.000.
Gautreaux, Gloria A.: *See—*
Harper, Robert J., Jr.; Blanchard, Eugene J.; Lofton, John T.; and Gautreaux, Gloria A., 3,960,477.
Gautschi, Fritz: *See—*
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Gavin, David F., to Olin Corporation. Separation of 3,4-diaminotoluene from a mixture of o-toluenediamine isomers. 3,960,963, Cl. 260-582.000.
Gavriljuk, Valentin Gennadievich: *See—*
Filatov, Nikolai Grigorievich; Gridnev, Vitaly Nikiforovich; Gavriljuk, Valentin Gennadievich; Meshkov, Jury Yakovlevich; Mashlenko, Felix Isaakovich; Mikhailov, Konstantin Vasilievich; Fedorov, Valery Ionovich; Marchenko, Vladimir Zakharovich; Lyskov, Ivan Konstantinovich; and Budilovsky, Viktor Alexandrovich, 3,959,999.
Gavrish, Petr Dmitrievich: *See—*
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Gaw, William, to Shell Oil Company. Reducing H_2S-emission from hot cast sulfur-asphalt mixtures. 3,960,585, Cl. 106-274.000.
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Gear, Robert B., Jr.; and Masepohl, John C., to G & W Electric Specialty Company. Universal power cable joint for use with power cables having various insulations. 3,961,127, Cl. 174-22.00R.
Gebr. Giulini GmbH: *See—*
Wittner, Hubert, 3,960,696.
Gebrueder Heller: *See—*
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Gee, Thomas A.; Jacobs, Gerald L.; and Baltare, Gunnar, to Eaton Corporation. Rotor for wheel speed sensor assembly. 3,961,215, Cl. 310-168.000.
Gehrs, Donald F.; and Higgins, David T., to Zinsco Electrical Products. Electrical bussing and jumper assembly. 3,961,129, Cl. 174-72.00B.
Geigel, Ronald J.: *See—*
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Geiger, Friedhelm; Heimberger, Werner; Schreyer, Gerd; and Weigert, Wolfgang, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Process for the production of cyanogen chloride and hydrogen chloride. 3,961,023, Cl. 423-383.000.
Gelotte, Karl O.: *See—*
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General Dynamics Corporation: *See—*
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Genevitz, Roberta L.; Genevitz, Joseph R.; and Sowell, John B. Luminous embossable tape. 3,961,112, Cl. 428-29.000.
Genzer, Jerome D.; and Fontsere, Francisco Carrio, to Warner-Lambert Company. Process for the preparation of 4-hydroxy-3-(5-methyl-3-isoxazolylcarbamoyl)-2-methyl-2H-1,2-benzothiazine 1,1-dioxide. 3,960,856, Cl. 260-243.00R.
George, John Barrett, to RCA Corporation. Bandstart detector system for a television tuning system. 3,961,263, Cl. 325-421.000.
Gerhardt, Klaus, to G. Siempelkamp and Co. Transporter for flat workpieces. 3,960,276, Cl. 214-1.0BT.
Gerstein, Bernard C.; and Macaulay, David B., to United States of America, Energy Research and Development Administration. Method of removing carbon monoxide from gases. 3,961,016, Cl. 423-247.000.
Gert Oestergaard, Vejle Plastic: *See—*
Pedersen, Henning Kristen, 3,960,641.
Geurts, Leonardus H.: *See—*
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Ghilardi, Giuliana; Bore, Pierre; and Grollier, Jean-Francois. Lyophilized and spray dried dyes. 3,960,476, Cl. 8-10.100.
Giaever, Ivar, to General Electric Company. Method and apparatus for quantitative surface inhibition test. 3,960,488, Cl. 23-230.00B.
Giaever, Ivar, to General Electric Company. Method and apparatus for determination of concentration of immunologically reactive biological particles. 3,960,489, Cl. 23-230.00B.
Giaever, Ivar, to General Electric Company. Method and apparatus for detecting immunologic reactions by diffusion in gel. 3,960,490, Cl. 23-230.00B.
Giaever, Ivar, to General Electric Company. Method and apparatus for detecting immunologically reactive biological particles. 3,960,491, Cl. 23-230.00B.
Giberti, Richard Andre: *See—*
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Gierse, Franz Josef: *See—*
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Gillespie, Robert A., to Stauffer Chemical Company. Controlled chemical injection system for washing machines. 3,961,231, Cl. 317-139.000.

Gilliam, Betty Lou: *See—*
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Gipstein, Edward; Moreau, Wayne M.; and Need, Omar U., III, to International Business Machines Corporation. Thermally stable positive polycarbonate electron beam resists. 3,961,099, Cl. 427-43.000.

Giraudi, Edouard; and Teisseire, Paul Jose, to Societe Anonyme Roure-Bertrand-Dupont. Process for the preparation of 8,14-cedranoxide. 3,960,899, Cl. 260-346.20M.

Givens, Edwin N.; Plank, Charles J.; and Rosinski, Edward J., to Mobil Oil Corporation. Converting low molecular weight olefins over zeolites. 3,960,978, Cl. 260-683.15R.

Gladden, David J.: *See—*
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Glastic Corporation, The: *See—*
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Glaxo Laboratories Limited: *See—*
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Long, Alan Gibson; Walker, Derek; Eastlick, David Thomas; and Stables, Harry Carson, 3,960,843.

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Gleason, Lawrence E. Adjustable lamp stand. 3,961,176, Cl. 240-81.0BC.

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Goble, George G.; and Rausche, Frank. Pile capacity testing means. 3,960,008, Cl. 73-84.000.

Godbersen, Harold W. Concrete slip forming apparatus. 3,959,977, Cl. 61-63.000.

Goettl, Adam D. Air delivery and treatment apparatus. 3,960,527, Cl. 55-269.000.

Goetz, George W., to Eaton Corporation. Inflator. 3,960,390, Cl. 280-731.000.

Goffe, William L., to Xerox Corporation. Photographic charging and imaging process. 3,960,555, Cl. 96-1.0PS.

Golden, Eddie R. Eye-shading means for automotive vehicle operators. 3,961,181, Cl. 250-208.000.

Goldman, Irving M.: *See—*
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Goldstein, Richard; and Feldman, Harold, to Dynascan Corporation. Emission testing circuit for color cathode ray tubes. 3,961,241, Cl. 324-20.0CR.

Goldsworthy, William Brandt. Method for inductive heat curing of conductive fiber stock. 3,960,629, Cl. 156-180.000.

Golitz, Friederich, to Maschinenfabrik Ernst Thielenhaus. Assembly for mounting an electric motor on a gearbox. 3,959,990, Cl. 64-27.0NM.

Golovanenko, Sergei Alexandrovich: *See—*
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Gonzati, Franco: *See—*
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Gordon, Abraham; and Adler, Stanford L., to Technicon Instruments Corporation. Liquid aspirating probe assembly of a supply analyzer. 3,960,020, Cl. 73-423.00A.

Gordon, James F., to Zeta Research Inc. Graphic recorder with paper positioning and tensioning means. 3,961,335, Cl. 346-136.000.

Gordon, Stuart: *See—*
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Gordy, Robert S., to NCR Corporation. Double sideband suppressed carrier modulator using surface wave device. 3,961,288, Cl. 332-44.000.

Gorgens, Richard A., to Incoterm Corporation. Card reader. 3,961,160, Cl. 235-61.11E.

Gorham, Jack C., to Hoerner Waldorf Corporation. Die cut container. 3,960,312, Cl. 229-37.00R.

Gorissen, Adrianus Marinus Johannes, to ITT Industries, Inc. Hydraulic telescopic shock absorber providing a damping effect which is dependent upon the position of the piston in the cylinder. 3,960,251, Cl. 188-286.000.

Gorski, Robert Alexander, to Du Pont de Nemours, E. I., and Company. Azeotrope-like compositions of methanol, nitromethane and trichlorotrifluoroethane. 3,960,746, Cl. 252-171.000.

Gortinskaya, Tatyana Vladimirovna; Mashkovsky, Mikhail Davidovich; Polezhaeva, Antonina Ivanovna; Nyrkova, Valentina Georgievna; Bondar, Larisa Nikolaevna; Litova, Galina Nikolaevna; Schukina, Maria Nikolaevna, deceased; and Preobrazhenskaya, Maria Nikolaevna, administrator. Antidepressant medicinal preparation. 3,961,058, Cl. 424-248.000.

Goserud, Chester O. Device for lubricating an internal combustion engine with powdered graphite. 3,960,132, Cl. 123-196.0CP.

Goshima, Takeshi; Sugiura, Yoshinori; Endo, Kiyonobu; Sato, Hideaki; Kono, Kimio; and Tsuji, Takao, to Canon Kabushiki Kaisha. Optical head moving device. 3,960,443, Cl. 350-247.000.

Gossie, Mijo A., to Corning Glass Works. Decal applying. 3,960,633, Cl. 156-247.000.

Gould Inc.: *See—*
Schenk, Raymond L., Jr.; Bruzas, John A.; and Coville, William E., 3,960,602.

Graf, Edward D. Soil stabilization by ion diffusion. 3,959,975, Cl. 61-36.00C.

Gralinski, Edward Richard, to Donley, Miller & Nowikas. Stored energy ejector mechanism. 3,960,023, Cl. 74-2.000.

Granada, Richard Paul: *See—*
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Grant, Daniel E. Vehicle anti-tampering anti-theft protection system. 3,961,310, Cl. 340-65.000.

Granzer, Ernold: *See—*
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Grapho Metronic GmbH & Co.: *See—*
Wirz, Burkhardt; and Decker, Peter, 3,960,451.

Gravlee, Joseph F., Jr. Method of preparing tissue for microscopic examination. 3,961,097, Cl. 427-2.000.

Greco, Nicholas P.; and Webb, David A., to Koppers Company, Inc. Method for preparing an improved creosote wood preservative from a coal tar creosote by the use of caustic compounds. 3,960,969, Cl. 260-627.00H.

Green, Charles E., to United States of America, Navy. Fluid for filling sonar transducers. 3,961,305, Cl. 340-8.0LF.

Green, Harold A.; Merianos, John J.; and Petrocci, Alfonso N., to Millmaster Onyx Corporation. Quaternary ammonium co-polymers for controlling the proliferation of bacteria. 3,961,042, Cl. 424-78.000.

Greene, Marvin: *See—*
Rosen, Bernard H.; Pelofsky, Arnold H.; and Greene, Marvin, 3,960,700.

Greer Hydraulics, Inc.: *See—*
Zahid, Abduz, 3,960,179.

Greever, Willis L., to United States of America, Navy. Case bonding composite for double base propellants. 3,960,088, Cl. 102-103.000.

Gregory, Donald R. Portable forge. 3,960,093, Cl. 110-3.500.

Greiner, Jonny R., to Caterpillar Tractor Co. Steering valve with linear spool dampening. 3,959,968, Cl. 60-384.000.

Gridnev, Vitaly Nikiforovich: *See—*
Filatov, Nikolai Grigorievich; Gridnev, Vitaly Nikiforovich; Gavrilijuk, Valentin Gennadievich; Meshkov, Jury Yakovlevich; Mashlenko, Felix Isaakovich; Mikhailov, Konstantin Vasilievich; Fedorov, Valery Ionovich; Marchenko, Vladimir Zakharovich; Lyskov, Ivan Konstantinovich; and Budilovsky, Viktor Alexandrovich, 3,959,999.

Griesmer, Jerome J., to Addressograph Multigraph Corporation. Constant current toner transfer. 3,960,556, Cl. 96-1.400.

Griffin, Lawrence C., to Griffin Research & Development, Inc. Polluted air effluent incinerating apparatus. 3,960,504, Cl. 23-277.00C.

Griffin Research & Development, Inc.: *See—*
Griffin, Lawrence C., 3,960,504.

Griffiths, Raymond Paul, to Welding Controls Limited. Backing ring assembly for pipes. 3,960,311, Cl. 228-49.000.

Griffiths, Thomas C.; and Slack, Albert L., to Eaton Corporation. Hoist control with limit switches. 3,960,362, Cl. 254-168.000.

Griggs, Elmer L. Classification gauge for vane clusters. 3,959,886, Cl. 33-174.00C.

Grollier, Jean-Francois: *See—*
Ghilardi, Giuliana; Bore, Pierre; and Grollier, Jean-Francois, 3,960,476.

Gross, Benjamin; Jacob, Solomon M.; Nace, Donald M.; and Voltz, Sterling E., to Mobil Oil Corporation. Simulation of catalytic cracking process. 3,960,707, Cl. 208-113.000.

Gruetzmacher, Gordon D.: *See—*
Gassman, Paul G.; and Gruetzmacher, Gordon D., 3,960,926.

Grumman Aerospace Corporation: *See—*
Lippert, Joseph, Jr., 3,960,345.

Gruppo Lepetit S.p.A.: *See—*
Pifferi, Giorgio; Omodei-Sale', Amedeo; and Consonni, Pietro, 3,960,858.

GTE Automatic Electric Laboratories Incorporated: *See—*
Mills, Jeffrey P., 3,961,167.

GTE Sylvania Incorporated: *See—*
Benda, David; and Davis, Charles Alfred, 3,961,221.
Chu, Gordon P. K., 3,960,533.
Port, David J.; Lafferty, William D.; and Cheney, Richard F., 3,960,545.
Say, Donald LeRoy, 3,961,220.

Gudmestad, Ragnar; and Sandblom, Sven O., to Artos Engineering Company. Method for producing electrical conductors of measured length. 3,960,040, Cl. 83-18.000.

Guerrero, Milton, to Escuela Politecnica Nacional. Process for recovering and isolating solasodine and glycosides thereof. 3,960,839, Cl. 260-210.500.

Guerrini, Gian Paolo; and Oddicini, Giuseppe, to Ing. C. Olivetti & C., S.p.A. Ribbon cartridge for typewriter, calculating, accounting or like office machines. 3,960,259, Cl. 197-151.000.

Guest, John E.: *See*—
Bodner, Ronald Eugene; Crooks, Thomas L.; Guest, John E.; Magrisso, Israel B.; and Slack, Keith K., 3,961,312.

Guglier, Michel: *See*—
Reynier, Jacques; and Guglier, Michel, 3,960,599.

Guibert, Clarence Robert: *See*—
Hough, William Vernon; Guibert, Clarence Robert; and Hefferan, Gerald Thomas, 3,961,017.

Gulf & Western Manufacturing Company (Michigan): *See*—
Gaines, Donald R.; and Jelenic, Bronko F., 3,960,457.

Gulf & Western Metals Forming Company: *See*—
Robertson, John M.; and Wyatt, Wilbur E., 3,961,149.

Gulin, Alexandr Nikolaevich: *See*—
Fridlyander, Iosif Naumovich; Yatsenko, Konstantin Petrovich; Nekrasova, Galina Anatolievna; Gulin, Alexandr Nikolaevich; Semenova, Zoya Grigorievna; Sidorov, Nikolai Grigorievich; Morozov, Boris Sergeevich; Krichevsky, Efrem Julievich; Zakharova, Tatyana Alexandrovna; and Sarycheva, Raisa Grigorievna, 3,960,551.

Gulton Industries, Inc.: *See*—
Weldon, Lawrence A.; and Bokalo, Peter, 3,961,155.

Gundlach, Robert W.; Whited, Charles A.; and Pike, Thomas W., to Xerox Corporation. Electrophotographic printing machine. 3,960,444, Cl. 355-3.0DD.

Gustafsson, Jan Kenneth, to AB Bofors. Analog-digital converter for a resistance bridge. 3,960,010, Cl. 73-88.50R.

Gustavs, Helmut; and Dudziak, Ernst, to Mohndruck Reinhard Mohn OHG. Drying arrangement for drying inks, adhesives and analogous substances on sheet material. 3,960,081, Cl. 101-416.00A.

Gutehoffnungshutte Sterkrade Aktiengesellschaft: *See*—
Weinrich, Hellmut, 3,960,245.

Guthrie, Robert William; and Kierstead, Richard Wightman, to Hoffmann-La Roche Inc. Amino citric acid derivatives. 3,960,933, Cl. 260-482.00P.

Gutlhuber, Johann; Muhlner, Karl; and Klenk, Peter, to Kunststoffwerk Gerbruder Anger GmbH & Co. Process and apparatus for manufacturing fittings, preferably pressure pipe insertion fittings of synthetic resin. 3,961,013, Cl. 264-297.000.

Gutman, Arnold D., to Stauffer Chemical Company. Certain oxime esters. 3,960,951, Cl. 260-566.0AC.

Gutowski, Gerald E., to Eli Lilly and Company. Acylated derivatives of pyrazofurin and process for their preparation. 3,960,836, Cl. 260-210.0AB.

H. H. Robertson Company: *See*—
Andrews, John S., 3,960,526.

Haas, Georges: *See*—
Ferrini, Pier Giorgio; Haas, Georges; and Rossi, Alberto, 3,960,868.

Haas, Hans: *See*—
Hochheimer, Hans-Joachim; Haas, Hans; Jacob, Hans-Ludwig; Helling, Paul; and Wulk, Bernhard, 3,961,307.

Habeck, Dietmar A.: *See*—
Galantay, Eugene E.; and Habeck, Dietmar A., 3,961,053.

Haberle, Wilhelm. Comminution device for scrap plastics. 3,960,335, Cl. 241-236.000.

Hackett, Barrie H.: *See*—
Miller, Robert C.; and Hackett, Barrie H., 3,961,157.

Haffer, Gregor; Eder, Ulrich; Laurent, Henry; Ruppert, Jurgen; Sauer, Gerhard; and Wiechert, Rudolf, to Schering Aktiengesellschaft. Process for the preparation of 17β-oxalyl steroids. 3,960,842, Cl. 260-239.55C.

Hagen, Helmut; and Niemeyer, Juergen, to BASF Aktiengesellschaft. 1,3-Diazacycloalkeno-[1,2,d]-benzo-[f-]-1,3,4-thiadiazepines. 3,960,862, Cl. 260-256.50R.

Hageneier, Werner: *See*—
Temme, Helmut; Hageneier, Werner; and Schneider, Hans-Dieter, 3,960,265.

Hahn, Frederick W., Jr.: *See*—
Brock, George W.; and Hahn, Frederick W., Jr., 3,961,372.

Haining, Frank W.; Kolly, Joseph M.; and Lynch, Thomas E., Jr., to International Business Machines Corporation. Method for making electrical lead frame devices. 3,960,561, Cl. 96-36.200.

Hakanson, Karin, to Levi Strauss & Co. Method of skewing twill fabric to avoid leg twist. 3,959,826, Cl. 2-227.000.

Halbeck, Werner B., to Cutler-Hammer, Inc. Miniature electronic watch switch. 3,961,145, Cl. 200-155.00A.

Halberschmidt, Friedrich; Paulus, Helmut; and Feiten, Karl-Josef, to Saint-Gobain Industries. Manufacture of glazing. 3,960,627, Cl. 156-104.000.

Halcon International, Inc.: *See*—
Russell, Joseph Lee; and Kollar, John, 3,960,954.

Hall, Alan James: *See*—
Davies, Phineas; and Hall, Alan James, 3,961,037.

Hall, George H. Method of forming a cutting tool. 3,960,518, Cl. 51-309.00R.

Hall, James K.: *See*—
Jones, Robert W.; and Hall, James K., 3,961,274.

Hall, St. John Merrill, Jr.: *See*—
Bickoff, Charles; and Hall, St. John Merrill, Jr., 3,960,256.

Hall, Wilbur S.: *See*—
Steinbrecher, Lester; and Hall, Wilbur S., 3,960,610.

Halliburton Company: *See*—
Cole, Robert Clay; Koch, Ronney R.; and Ramos, Joseph, 3,960,801.

Halls, Lawrence M., to Sperry Rand Corporation. Crop harvesting machine header suspension system. 3,959,957, Cl. 56-208.000.

Halsten, Lawrence E. Grass cutting and pulverizing rotary mower. 3,959,954, Cl. 56-12.800.

Ham, Allan Leslie: *See*—
Cox, David Alexander; Danilewicz, John Christopher; Ham, Allan Leslie; Kemp, John Edward Glyn; and Snarey, Michael, 3,961,072.

Hamaguchi, Hiroshi, to Minolta Camera Kabushiki Kaisha. Driving mechanism for endless sensitive member. 3,960,306, Cl. 226-96.000.

Hamilton, Harold E.; and Oelke, Waldemar W., to Libbey-Owens-Ford Company. Method of and apparatus for bending glass sheets. 3,960,535, Cl. 65-104.000.

Hamilton, Samuel L. Refrigerant moisture detection system. 3,959,980, Cl. 62-126.000.

Hamisch, Paul H., Jr.; and Oakley, James A., to Monarch Marking Systems, Inc. Apparatus for printing and applying pressure sensitive labels. 3,960,642, Cl. 156-384.000.

Hammann, Ingeborg: *See*—
Kramer, Wolfgang; Draber, Wilfried; Hammann, Ingeborg; and Scheinpflug, Hans, 3,961,061.

Hammar, Walton James, to Riker Laboratories, Inc. 8-Carboxamide dibenzobicyclo(3.2.1)octadienes. 3,960,944, Cl. 260-558.00R.

Hammer, Klaus-Dieter; Porrmann, Herbert; and Klenk, Ludwig. Fiber fleece containing a polymeric reinforcing material, and process for the production of such fleece. 3,961,107, Cl. 427-246.000.

Hamner, Glen P.; and Mattox, William J., to Exxon Research and Engineering Company. Alumina synthesis. 3,961,036, Cl. 423-628.000.

Hanna Mining Company, The: *See*—
Dicks, Mason L.; and Morrow, James B., 3,960,715.

Hannah, Harvey John. Underwater cleaning. 3,959,838, Cl. 15-1.700.

Hansen, Jens, to Blaupunkt-Werke GmbH. Disturbance pulse detector circuit for radio receiver blanking. 3,961,268, Cl. 325-478.000.

Hansen, Robert L., to Minnesota Mining and Manufacturing Company. Process for carbodiimide synthesis. 3,960,950, Cl. 260-566.00R.

Hansen, Uwe: *See*—
Dielacher, Maximilian; and Hansen, Uwe, 3,960,703.

Hanson, Christina D.; and Duchmann, Gail E. Perceptual cells writing guide. 3,959,894, Cl. 35-38.000.

Harada, Katsumasa: *See*—
Ichigo, Minoru; Suzuki, Takeshi; and Harada, Katsumasa, 3,960,108.

Hardouin, Jean-Claude Henri Raoul; and Vallette, Maurice Rene Jean, to Produits Chimiques Ugine Kuhlmann. Anhydrous bases and salts of dyestuffs of the auramine series, process for their preparation and their use. 3,960,952, Cl. 260-566.00R.

Harendza-Harinxma, Alfred J. Method of carbonizing a substance comprising cellulose. 3,961,025, Cl. 423-415.00R.

Hargrave, Michael E., to Fisher Controls Company. High pressure tight shutoff valve seal. 3,960,364, Cl. 251-210.000.

Harold, Billy E. Vehicle transport trailer. 3,960,401, Cl. 296-1.00A.

Harp, Charles, Jr.: *See*—
Noecker, Marshall V.; Thom, Kenneth C.; and Harp, Charles, Jr., 3,959,926.

Harper, Robert J., Jr.; Blanchard, Eugene J.; Lofton, John T.; and Gautreaux, Gloria A., to United States of America, Agriculture. Crosslinked cotton fabrics. 3,960,477, Cl. 8-15.000.

Harris, Barron M., Sr.; and Johnson, Doyle F., to North American Culvert Corporation. Nesting support apparatus for fowl. 3,960,111, Cl. 119-23.000.

Harris Corporation: *See*—
Renz, Alfred C.; Spacie, Roy W.; and Fuller, Edward J., 3,960,011.

Harris, David Isaac; and Johnston, Loren Bainum, to RCA Corporation. Method for developing electron beam sensitive resist films. 3,961,100, Cl. 427-43.000.

Harris-Intertype Corporation: *See*—
Gaffney, John Marshall, 3,960,374.

Harris, Louis Selig; Pars, Harry George; Razdan, Raj Kumar; and Sheehan, John Clark, to Sharps Associates. Esters of thienobenzopyrans and thiopyranobenzopyrans. 3,960,871, Cl. 260-293.570.

Harris, Thomas, to Glastic Corporation, The. Die structure for forming a serrated rod. 3,960,473, Cl. 425-467.000.

Harrison, Ian T.: *See*—
Fried, John H.; and Harrison, Ian T., 3,960,936.

Harshaw Chemical Company, The: *See*—
Hildering, Roelof; and Mudrak, Anton, 3,960,677.

Hartbauer, Ellsworth A.; and Rehr, Henry W., to Crown Zellerbach Corporation. Roll product with manually graspable tail end and manufacture thereof. 3,960,272, Cl. 206-389.000.

Hartkorn, Albert W., to American Multi-Lert Corporation. Cargo monitor apparatus and method. 3,961,323, Cl. 340-280.000.

Hartleroad, Ronald J.; Krajewski, James C.; and Rayon, Ronald G., to General Motors Corporation. Magnetic alignment for semiconductor device bonding. 3,960,279, Cl. 214-1.0BV.

Hartley Controls Corporation: *See*—
Hartley, Nelson, 3,961,230.

Hartley, Nelson, to Hartley Controls Corporation. Current relay actuated by multistage amplifier's total current drains. 3,961,230, Cl. 317-123.000.

Hartmann, Clinton S.; and Schoenwald, Jeffrey Stuart, to Texas Instruments Incorporated. Multi-resonant surface wave resonator. 3,961,293, Cl. 333-72.000.

Hasagawa, Shiro: *See—*
Tamura, Masaki; Ushiro, Soichiro; and Hasagawa, Shiro, 3,960,663.
Hatch, Robert A.: *See—*
Close, James R.; Wood, William P.; Hatch, Robert A.; and Johnson, James R., 3,959,865.
Hatchett, Jerry L., to Goodyear Aerospace Corporation. Automatic focusing of optical images. 3,961,177, Cl. 250-201.000.
Hatta, Masami; and Ohkawa, Tetsusi, to Hitachi Metals, Ltd. Apparatus for cutting off cast parts from a runner of a casting body. 3,959,930, Cl. 51-92.0ND.
Hattori, Yoshinori: *See—*
Morishita, Masataka; Inaba, Yoshihito; Fukushima, Mitsuru; Hattori, Yoshinori; Kobari, Sadami; and Matsuda, Tetsuo, 3,960,757.
Haubner, Georg: *See—*
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Haug, Theobald: *See—*
Renner, Alfred; and Haug, Theobald, 3,960,812.
Haughton, Paul F.; and McCoy, Thomas E., to Romac Metals, Inc. Modular display system with interlocking frame members. 3,960,275, Cl. 211-182.000.
Hauke, Francis E.: *See—*
Baumann, Gerald W.; Fraser, Harvey R., Jr.; and Hauke, Francis E., 3,961,369.
Hawkins, John L., Jr.: *See—*
Naus, Hubert W.; and Hawkins, John L., Jr., 3,960,428.
Hayashi, Katsumi, to Fuji Photo Film Co., Ltd. Process and composition for producing photolithographic plate for the graphic arts. 3,960,567, Cl. 96-66.500.
Hayashi, Takao: *See—*
Ogata, Yasuhiro; and Hayashi, Takao, 3,960,638.
Hayashi, Yoshio: *See—*
Ibata, Jyoji; Kobayashi, Hidehiko; Toyomoto, Kazuo; Suzuoki, Kazuhiro; Hayashi, Yoshio; and Kurihara, Masakazu, 3,960,572.
Hayashibara Biochemical Laboratories, Incorporated: *See—*
Sano, Takezo; Uemura, Yukikazu; and Furuta, Akihiro, 3,960,685.
Hayes, Jimmie R., to Cabot Corporation. Bag filter leak detection. 3,960,001, Cl. 73-40.700.
Hayes, John C., to Universal Oil Products Company. Hydrocarbon conversion with a trimetallic catalytic composite. 3,960,709, Cl. 208-139.000.
Hayes, John C.: *See—*
Antos, George J.; Hayes, John C.; and Pollitzer, Ernest L., 3,960,711.
Pollitzer, Ernest L.; and Hayes, John C., 3,960,710.
Hayes, Stephen Harry: *See—*
Whitworth, Edward; Gordon, Stuart; and Hayes, Stephen Harry, 3,960,621.
Hazaki, Eiichi: *See—*
Kometani, Eiji; Imai, Masaya; and Hazaki, Eiichi, 3,960,057.
Hazel, Herbert Kenneth, to International Business Machines Corporation. Fine wire twisted pair routing and connecting system. 3,960,309, Cl. 228-5.100.
Hearn, Ralph E.; and McMillen, Clarence, to PPG Industries, Inc. Coating glass sheets on both surfaces. 3,961,120, Cl. 428-210.000.
Heck, Richard F., to University of Delaware, The. Process for the preparation of aldehydes from organic halides. 3,960,932, Cl. 260-479.00R.
Hefferan, Gerald Thomas: *See—*
Hough, William Vernon; Guibert, Clarence Robert; and Hefferan, Gerald Thomas, 3,961,017.
Heichele, Friedrich; Vojtechovsky, Georg; Hollenbach, Georg; Adler, Klaus; and Bauer, Johann, to Wacker-Chemie GmbH. Impact-resistant molding compositions containing polyvinyl chloride. 3,960,986, Cl. 260-876.00R.
Heil, Jurgen: *See—*
Lohnert, Gunter; Muller-Frank, Ulrich; and Heil, Jurgen, 3,960,656.
Heim, Peter: *See—*
Mosimann, Hans; Heim, Peter; and Borer, Charles, 3,960,799.
Heim Universal Corporation: *See—*
McCloskey, Albert R., 3,960,416.
Heimbach, Heinrich: *See—*
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Munzner, Heinrich; Heimbach, Heinrich; Korbacher, Werner; Peters, Werner; Juntgen, Harald; Knoblauch, Karl; and Zundorf, Dieter, 3,960,769.
Heimberger, Werner: *See—*
Geiger, Friedhelm; Heimberger, Werner; Schreyer, Gerd; and Weigert, Wolfgang, 3,961,023.
Heinrich, Ernst; Mix, Konrad; and Ribka, Joachim, to Cassella Farbwerke Mainkur Aktiengesellschaft. Bisazo dyestuffs of the 2,6-diaminopyridine series. 3,960,480, Cl. 8-41.00R.
Heinsohn, Howard H., Jr.: *See—*
Evers, William J.; Heinsohn, Howard H., Jr.; Mayers, Bernard J.; and Karoll, Elizabeth A., 3,961,093.
Heinz Hermann Weick: *See—*
Trueb, Victor, 3,960,274.
Heitman, Knut: *See—*
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Heitmann, Wilhelm: *See—*
Ester, Wilhelm, deceased; Lovis, Brigitte, nee Ester, heir; Ester, Wolfgang, heir; and Heitmann, Wilhelm, 3,960,672.
Heitzinger, Friedrich; and Lechleitner, Wilhelm, to Schwarzkopf Development Corporation. Device for temperature measurements. 3,960,604, Cl. 136-233.000.
Hekimian Laboratories, Inc.: *See—*
Hekimian, Norris C., 3,961,255.
Hekimian, Norris C.; and Mack, Walter, 3,961,264.
Hekimian, Norris C., to Hekimian Laboratories, Inc. Measurement bandwidth enhancement in phase lock loops. 3,961,255, Cl. 324-83.00R.
Hekimian, Norris C.; and Mack, Walter, to Hekimian Laboratories, Inc. Linear frequency converter with gain independent of circuit parameters. 3,961,264, Cl. 325-451.000.
Hellberg, Arvid Emanuel, to Plate Kofasil Gesellschaft mit beschrankter Haftung. Ensiling of green fodder with hexamethylene tetramine and sodium nitrite. 3,961,079, Cl. 426-54.000.
Heller, Harold L.: *See—*
Eberl, James Joseph; Thelen, Edmund; and Heller, Harold L., 3,961,105.
Helling, Paul: *See—*
Hochheimer, Hans-Joachim; Haas, Hans; Jacob, Hans-Ludwig; Helling, Paul; and Wulk, Bernhard, 3,961,307.
Hemmerling, Volker: *See—*
Deubel, Reinhold; Hemmerling, Volker; Reitz, Werner; and Teige, Wolfgang, 3,960,591.
Hemotec, Inc.: *See—*
Kuhn, William E., 3,960,151.
Hendricks, Jon Michael. Wash basin drain filter. 3,959,831, Cl. 4-287.000.
Henig, Seymour, to American Chain & Cable Company, Inc. Accumulating conveyor. 3,960,262, Cl. 198-127.00R.
Henkel & Cie G.m.b.H.: *See—*
Ploger, Walter; Schmidt-Dunker, Manfred; and Gloxhuber, Christian, 3,960,888.
Henrick, Clive A.; and Staal, Gerardus B., to Zoecon Corporation. Esters of cyclopropyl substituted carboxylic acids. 3,960,907, Cl. 260-410.90R.
Henson, Howard K. Method for maximizing throughput in an ore grinding system. 3,960,330, Cl. 241-30.000.
Herberlein Textildruck AG: *See—*
Leimbacher, Erwin; Marte, Walter; and Buchele, Ferdinand, 3,960,484.
Herbst, Wayne R.; and Mika, Paul L., to Teletype Corporation. Apparatus for recording and reproducing digital data. 3,961,368, Cl. 360-48.000.
Herculite Protective Fabrics Corporation: *See—*
Kydonieus, Agis F.; and Smith, Inja, 3,961,117.
Hering, Frederic S.; Ohlbaum, Robert H.; and Crisci, Joseph R., to United States of America, Navy. Reduced shear stress end fitting. 3,960,459, Cl. 403-267.000.
Heritage, Robert, to Rotaflex (Great Britain) Limited. Electrical installation. 3,960,426, Cl. 339-21.00R.
Hermann Heye: *See—*
Becker, Kurt, 3,960,266.
Hermes Precisa International S.A.: *See—*
Aebi, Otto, 3,960,258.
Hertzenberg, Elliot P.: *See—*
Netting, David I.; and Hertzenberg, Elliot P., 3,960,583.
Heskett, Don E., to Fluid Power Research, Inc. Fluid treating apparatus and method. 3,960,721, Cl. 210-25.000.
Hess, Thomas M.: *See—*
Speraw, Floyd G.; Hess, Thomas M.; and Sampson, Harold J., 3,960,420.
Heusser, Eduard, to Zellweger, Ltd. Method of increasing the long-term stability of a measuring element of textile testers. 3,960,593, Cl. 134-37.000.
Hewlett-Packard Company: *See—*
Kim, Young Dae, 3,961,286.
Tiefert, Karl H., 3,961,350.
Heytmeijer, Herman R.; and Panaccione, Elmer S., to United States of America, Interior. Method for applying wax or plastic coatings to granular materials. 3,961,106, Cl. 427-221.000.
Hibino, Masaru, to Toyota Jidosha Kogyo Kabushiki Kaisha. Timing chain tensioner. 3,960,026, Cl. 74-242.11S.
Hicks, Darrell D., to Celanese Coatings & Specialties Company. Mercaptan initiated polymerization process carried out in the presence of oxygen. 3,960,824, Cl. 526-85.000.
Higgens, Calvin E.: *See—*
Gale, Richard M.; Higgens, Calvin E.; and Hoehn, Marvin M., 3,960,667.
Higgins, David T.: *See—*
Gehrs, Donald F.; and Higgins, David T., 3,961,129.
High, Cliff R.; and Brotman, Morley, to Morley Studios. Apparatus for conveying and engraving tokens. 3,960,257, Cl. 197-6.700.
Higuchi, Takeru: *See—*
Hussain, Anwar A.; Higuchi, Takeru; and Shell, John W., 3,960,150.
Hildering, Roelof; and Mudrak, Anton, to Harshaw Chemical Company, The. Acid zinc electroplating. 3,960,677, Cl. 204-55.00R.
Hille, Peter M., to International Standard Electric Corporation. Method of manufacturing a solid electrolytic capacitor. 3,959,873, Cl. 29-570.000.

Hiller, Sigwart; and Schad, Harald, to Kraftwerk Union Aktiengesellschaft. Device for monitoring activity of gases. 3,961,189, Cl. 250-304.000.

Hintergraber, Maximilian, to Kraftwerk Union Aktiengesellschaft. Flywheel with anti-cracking safeguard for protection against overspeed. 3,960,034, Cl. 74-609.000.

Hippolyte Juy, Lucien Charles. Push flange construction for a pivotal roller system of a speed change mechanism. 3,960,025, Cl. 74-217.00B.

Hippolyte JUY, Lucien Charles; and Suckfull, Fritz, to Bayer Aktiengesellschaft. Disazo dyestuffs containing amino azo benzene sulfonic acid and phenolic or naphtholic couplers. 3,960,831, Cl. 260-186.000.

Hirai, Katsumi: *See—*
Tsujikawa, Masahiro; Ozasa, Minoru; Takagi, Fumio; Hirai, Katsumi; Iwasaki, Akio; Imamura, Hiroshi; and Ueda, Testuhiro, 3,960,507.

Hiraoka, Tetsuo; and Sugimura, Yukio, to Sankyo Company Limited. Process for preparing 7β-acylamino-7α-alkoxycephalosporins or 6β-acylamino-6α-alkoxypenicillins. 3,960,845, Cl. 260-239.100.

Hirate, Masao, to Nippon Electric Company Limited. Exclusion circuit in key telephone system. 3,961,144, Cl. 179-99.000.

Hirose, Yoshio: *See—*
Enei, Hitoshi; Sato, Katsuaki; and Hirose, Yoshio, 3,960,660.
Enei, Hitoshi; Sato, Katsuaki; Ishii, Morikatsu; and Hirose, Yoshio, 3,960,661.

Hirsbrunner, Pierre; and Bertholet, Raymond, to Societe D'Assistance Technique pour Produits. Leucine isoleucine separation. 3,960,942, Cl. 260-534.00R.

Hitachi Chemical Company, Ltd.: *See—*
Numata, Shunichi; Yokono, Hitoshi; Mukai, Junji; Muroi, Tadashi; Nakano, Mineo; and Manabe, Mikio, 3,960,982.

Hitachi Construction Machinery Co., Ltd.: *See—*
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Numata, Shunichi; Yokono, Hitoshi; Mukai, Junji; Muroi, Tadashi; Nakano, Mineo; and Manabe, Mikio, 3,960,982.
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Hitachi Metals, Ltd.: *See—*
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Sato, Kuniaki; Toyama, Kozo; Saheki, Toshio; Mizukoshi, Kaoru; and Suzuki, Shuei, 3,960,458.

Hochheimer, Hans-Joachim; Haas, Hans; Jacob, Hans-Ludwig; Helling, Paul; and Wulk, Bernhard, to Ruhrkohle Aktiengesellschaft. Exploration of the boundaries of an underground coal seam. 3,961,307, Cl. 340-15.5CP.

Hochstrasser, Harry T. Apparatus and method for isolating soluble blood components. 3,960,727, Cl. 210-78.000.

Hodge, Edward B., to Commercial Solvents Corporation. Zearalanone-zearalanol product. 3,960,898, Cl. 260-343.20F.

Hodge, John S. Building structure. 3,959,939, Cl. 52-301.000.

Hoechst Aktiengesellschaft: *See—*
Bayer, Ernst; and Mutter, Manfred, 3,960,830.
Deubel, Reinhold; Hemmerling, Volker; Reitz, Werner; and Teige, Wolfgang, 3,960,591.
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Hoehn, Marvin M.: *See—*
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Hoerner Waldorf Corporation: *See—*
Gorham, Jack C., 3,960,312.

Hofer, Walter; Haubner, Georg; and Schmaldienst, Peter, to Robert Bosch G.m.b.H. Compensated semiconductor ignition system for internal combustion engines. 3,960,129, Cl. 123-148.0CC.

Hoffman, Bruce E.; and Berkley, S. Thomas, to International Telephone and Telegraph Corporation. Multi-terminal arrestor holder and connector module. 3,961,226, Cl. 317-61.500.

Hoffmann-La Roche Inc.: *See—*
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Guthrie, Robert William; and Kierstead, Richard Wightman, 3,960,933.
Maestrone, Gian Paolo; and Mitrovic, Milan, 3,961,068.
Olson, Gary Lee; and Saucy, Gabriel, 3,960,967.
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Hoffmann, Manfred: *See—*
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Hofling, Erich; and Breu, Hanspeter, to Swiss Aluminium Ltd. Method of making strip-shaped multiple conductor. 3,960,622, Cl. 156-3.000.

Hogan, Gary LaDon, to LaDon Corporation. Hair treatment appliance. 3,960,160, Cl. 132-112.000.

Holbrook, Legrand K.; and Sturdevant, Gary F., to Medical Development Corporation. Fluid collection bottle with improved air flow valve means. 3,960,165, Cl. 137-202.000.

Holl, Helmer Heinz: *See—*
Papajewski, Reinhold; and Holl, Helmer Heinz, 3,960,098.

Holland, Charles L.: *See—*
Baxter, George I.; Rolla, Clarence P.; and Holland, Charles L., 3,960,206.

Holland-Letz, Guenter, to Nixdorf Computer AG. Device for holding down sheet material. 3,960,304, Cl. 226-74.000.

Hollenbach, Georg: *See—*
Heichele, Friedrich; Vojtechovsky, Georg; Hollenbach, Georg; Adler, Klaus; and Bauer, Johann, 3,960,986.

Holliday, Robert G., to Xerox Corporation. Microfiche storage unit. 3,959,904, Cl. 40-102.000.

Hollinger, Paul, to Maryland Cup Corporation. Industrial straw dispensing carton. 3,960,299, Cl. 222-559.000.

Hollinger, Roderich; Wendtlandt, Wolf; and Schneider, Gerda, to Chemie Linz Aktiengesellschaft. 1,1-Diphenyl-1-lower alkoxy-aminoalkanes and the salts thereof. 3,960,960, Cl. 260-570.00R.

Holloway, Ronald Webb: *See—*
Cradeur, Robert R.; and Holloway, Ronald Webb, 3,959,845.

Hollyday, Robert David, to AMP Incorporated. Connector having filter adaptor. 3,961,294, Cl. 333-79.000.

Hollyday, Robert David; and Bradbery, Jack Leo, to AMP Incorporated. Solderless filter assembly. 3,961,295, Cl. 333-79.000.

Holmes, Harold Edwin; and Oriolo, Enzo, to Electric Power Transmission Pty. Limited. Pole structure. 3,959,946, Cl. 52-731.000.

Holmes, Jack K.: *See—*
Chen, Chang Chung; Holmes, Jack K.; and Lewis, James L., 3,961,282.

Holmes, Richard N., to McDonnell Douglas Corporation. Lock core panel. 3,960,236, Cl. 181-33.00G.

Holmes, Robert Taylor, to Serck Industries Limited. Method of manufacturing heat exchangers. 3,961,010, Cl. 264-221.000.

Holstein, Herbert; and Farrenkothen, Armin, to Oswald Forst Maschinenfabrik und Apparatebauanstalt GmbH. Vertical broaching machine. 3,960,056, Cl. 90-73.000.

Homma, Itomi; Mino, Junryo; and Kunikawa, Kenzo, to Kao Soap Co., Ltd. Powder detergent composition. 3,960,744, Cl. 252-102.000.

Honea, William S., Jr., to T. L. James Company, Inc. Form support means for use with performed girders. 3,960,357, Cl. 249-211.000.

Honeywell Inc.: *See—*
Bonne, Ulrich, 3,960,438.
Erdmann, David P.; and Kurschner, Dennis L., 3,961,320.
Hutch, Frederick; S., 3,961,203.
Schierholz, Edward A.; and Nardi, Frank, 3,960,349.

Honnen, Lewis R., to Chevron Research Company. Hydrocarbyl amine additives for distillate fuels. 3,960,515, Cl. 44-58.000.

Hoogovens Ijmuiden, B.V.: *See—*
Breedijk, Theo, 3,960,615.
Vermeulen, Jacobus Cornelis; and Stuart, Eric Jan, 3,961,032.

Hoover, John R. E.: *See—*
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De Marinis, Robert M.; and Hoover, John R. E., 3,960,852.
De Marinis, Robert M.; and Hoover, John R. E., 3,960,853.
De Marinis, Robert M.; and Hoover, John R. E., 3,960,855.

Hopton, Edward J.: *See—*
Cloud, Robert H.; and Hopton, Edward J., 3,959,892.

Horak, Vladimir. Continuous liquid proportioning system. 3,960,295, Cl. 222-145.000.

Horii, Tetsuo; Chiyomaru, Isao; Kawada, Seigo; and Takita, Kiyoshi, to Kumiai Chemical Industry Co., Ltd. Method for controlling mites and thioureidobenzene phosphates. 3,961,049, Cl. 424-211.000.

Horn, Stuart B., to United States of America, Army. Low void volume regenerator for Vuilleumier cryogenic cooler. 3,960,204, Cl. 165-4.000.

Hornbostel, Lloyd H., Jr., to Center for Management Services and Applied Research. Detection system. 3,961,328, Cl. 340-420.000.

Horne, Juliana S. Apparatus for applying liquid preparations to the body. 3,959,841, Cl. 15-104.940.

Horowitz, Charles, to Sloan Valve Company. Gladhand with shutoff cock. 3,960,365, Cl. 251-286.000.

Horsens Plastic A/S: *See—*
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Hortin, Kenneth L.: *See—*
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Hosoe, Kazuya; Aizawa, Hiroshi; Matsumoto, Seiichi; and Yokota, Hideo, to Canon Kabushiki Kaisha. Image sharpness detecting system and apparatus utilizing the same. 3,961,178, Cl. 250-201.000.

Hosoi, Masahiro: *See—*
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Hosokawa, Hiroyuki; Maeda, Shiro; and Yamada, Kenji, to Nippondenso Co., Ltd. Hose connector. 3,960,393, Cl. 285-137.00R.

Houdaille Industries, Inc.: *See—*
Mc Elwain, James A., 3,960,372.

Hough, William Vernon; Guibert, Clarence Robert; and Hefferan, Gerald Thomas, to Mine Safety Appliances Company. Production of dodecahydrododecaborate (2-). 3,961,017, Cl. 423-286.000.

Houston Engineering Research Corporation: *See—*
Ahlgren, Erick L.; McMorris, Arthur H.; Miille, Jerry L.; and Schweppe, Joseph L., 3,960,072.

Hovey, John M.: *See—*
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Hovorak, William P. Hog oiler. 3,960,114, Cl. 119-157.000.

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Striegler, John Howard; and Howell, Eddie Paul, 3,960,214.

Hsiao, James C., to Union Special Corporation. Automatic button positioning apparatus. 3,960,094, Cl. 112-110.000.

Hubbell, Franklin R., III, to Tenneco Inc. Exhaust system mounting. 3,960,232, Cl. 180-64.00A.

Hubele, Adolf, to Ciba-Geigy Corporation. Imidazolidine-2,4-dione derivatives and their use as pesticides. 3,960,883, Cl. 260-309.500.

Huber, Rolf: *See—*
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Hubert, Hans-Juergen: *See—*
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Hubner, Wolfgang; and Fasshauer, Wilhelm, to Deutsches Brennstoffinstitut Freiberg. Pipe union. 3,960,394, Cl. 285-297.000.

Hucks, Uwe: *See—*
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Hudson, Frederick W., to Xerox Corporation. Self adjusting corona device. 3,961,193, Cl. 250-324.000.

Hudson, Ralph B., Jr.: *See—*
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Huebner, Victor R., to Technical Hardware, Inc. Color monitor utilizing ambient light illumination. 3,960,452, Cl. 356-173.000.

Hufford, James N., to CTS Corporation. Variable resistance control. 3,961,302, Cl. 338-174.000.

Hughes Aircraft Company: *See—*
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Moulin, Norbert L., 3,960,429.
Myer, Jon H., 3,961,316.

Hughes, John A. Reversible necktie. 3,959,825, Cl. 2-146.000.

Huille, Michel Ernest Antoine; and Cabut, Louis Antoine, to Produits Chimiques Ugine Kuhlmann. Phthalocyanines, compositions derived therefrom and processes for their preparation. 3,960,587, Cl. 106-288.00Q.

Hull, Edward M.: *See—*
Aboaf, Joseph A.; Broadie, Robert W.; Hull, Edward M.; and Pogge, H. Bernhard, 3,961,353.

Humerickhouse, Billy J.: *See—*
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Hunt, Harry, to Alpine Designs, Inc. Sleeping bag construction. 3,959,834, Cl. 5-343.000.

Hunt, William E., to United States of America, Navy. Ejection launch mechanism. 3,960,051, Cl. 89-1.800.

Hurley, William J.; and Muhlfeld, Hans P., to International Business Machines Corporation. Testing embedded arrays. 3,961,251, Cl. 324-73.0AT.

Hursey, Martin E. Light shield/support device. 3,961,159, Cl. 235-1.00D.

Hussain, Anwar A.; Higuchi, Takeru; and Shell, John W., to Alza Corporation. Bioerodible ocular device. 3,960,150, Cl. 128-260.000.

Hutch, Frederick; S., to Honeywell Inc. Signal correlator. 3,961,203, Cl. 307-236.000.

Hutcheon, Robert Stewart. Real-time cross-correlation signal processor. 3,961,172, Cl. 235-181.000.

Hutchison, Stanley O.; and Anderson, Glenn W., to Chevron Research Company. Method of obtaining permeability information from an underground formation penetrated by a well. 3,960,014, Cl. 73-151.000.

Hutchison, Stanley O.; and Mitchell, Neal L., to Chevron Research Company. Gas operated hydraulically actuated wire line packer. 3,960,211, Cl. 166-187.000.

Hutchison, Stanley O., to Chevron Research Company. Method of obtaining impression information from a well. 3,960,212, Cl. 166-250.000.

Hutt, Peter Richard; Blake, Alan Ronald; von Cavallar, Gunter; Douglas, Brian Neil; and Dodds, Philip John, to Independent Broadcasting Authority. Biphase digital television systems. 3,961,137, Cl. 178-68.000.

Huvar, Arthur J., to Mobil Oil Corporation. Deodorized pesticidal organothiophosphorus compounds. 3,961,043, Cl. 424-76.000.

Huyser, Marvin E.: *See—*
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Hydrel A.G.: *See—*
Abbuhl, Hermann; and Tanner, Hans, 3,960,413.

Hyer, Frank S.; and Karosas, Raymond, to Hyer Industries, Inc. Conveyor belt system with positional transformation of weight data. 3,960,225, Cl. 177-121.000.

Hyer Industries, Inc.: *See—*
Hyer, Frank S.; and Karosas, Raymond, 3,960,225.

I.C.M. Industries, Inc.: *See—*
Piaget, Robert E.; and Clyburn, Charles W., 3,960,427.

Ibata, Jyoji; Kobayashi, Hidehiko; Toyomoto, Kazuo; Suzuoki, Kazuhiro; Hayashi, Yoshio; and Kurihara, Masakazu, to Asahi Kasei Kogyo Kabushiki Kaisha. Photosensitive compositions comprising a polyester-polyether block polymer. 3,960,572, Cl. 96-115.00P.

Ichigo, Minoru; Suzuki, Takeshi; and Harada, Katsumasa, to Kikusui Kagaku Kogyo Kabushiki Kaisha. Spray coating apparatus. 3,960,108, Cl. 118-324.000.

Ideal Toy Corporation: *See—*
Ieda, Michael, 3,959,920.

Idemitsu, Kosan Kabushiki Kaisha (Idemitsu Kosan Co., Ltd.): *See—*
Tomikawa, Masami; Tsunoda, Akiji; Kaneda, Kazuhisa; Ohkawa, Hideo; and Mugino, Yutaka, 3,960,722.

Ieda, Michael, to Ideal Toy Corporation. Breakaway stunt car. 3,959,920, Cl. 46-201.000.

Iijima, Tetsuya, to Nisan Motor Co., Ltd. Transmission locking system. 3,960,235, Cl. 180-82.00A.

Ikenoue, Shinpei; and Masuda, Takao, to Fuji Photo Film Co., Ltd. Method for dry stabilization of silver halide photographic material. 3,960,566, Cl. 96-61.00R.

Ikenoue, Shinpei; and Masuda, Takao, to Fuji Photo Film Co., Ltd. Process for preparing organosilver carboxylates. 3,960,908, Cl. 260-414.000.

Illinois Tool Works Inc.: *See—*
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Imperial Chemical Industries, Inc.: *See—*
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Imperial Chemical Industries Limited: *See—*
Billany, Michael Royston; Longworth, Arthur Raymond; and Shatwell, John, 3,960,745.
Birchall, James Derek; and Cassidy, John Edward, 3,960,592.
Clark, Duncan, 3,960,930.
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Lindley, John; and McLeod, Andrew John, 3,959,978.
O'Mant, Derrick Michael, 3,960,893.
Pumphrey, Nicholas William James; and Woods, William Laurence, 3,960,680.
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Incoterm Corporation: *See—*
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Independent Broadcasting Authority: *See—*
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De Sandre, Giovanni; Subrizi, Angelo; and Bretti, Franco, 3,961,170.
Guerrini, Gian Paolo; and Oddicini, Giuseppe, 3,960,259.

Ingham, Lawrence Allister. Rotary engine. 3,960,116, Cl. 123-8.450.

Ingram, Maxwell. Shaft horsepower and efficiency monitoring system. 3,960,012, Cl. 73-136.00A.

Inman, Charles Edward, to Pennwalt Corporation. Water-in-oil emulsions of fluoroalkyl polymer, chlorinated alkane solvent and nonioinic surfactant. 3,960,797, Cl. 260-29.60F.

Innerfield, Irving, to Association for Pharmacologic Research, Inc. Urine diagnostic test for fibrinolytic activity. 3,960,669, Cl. 195-103.50R.

Inoue, Hisao: *See—*
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Inouye, Kozo: *See—*
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Institut po Metaloznanie i Technologia na Metalite: *See—*
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Institutes of Medical Sciences, The: *See—*
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Instrumentation Laboratory, Inc.: *See—*
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Intech, Inc.: *See—*
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Interatom, Internationale Atomreaktrobau GmbH: *See—*
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Irelan, Edward A.; Dorheim, David W.; and Robotham, William Frederick, to McGraw-Edison Company. Convertible portable electric tool. 3,959,878, Cl. 30-220.000.
Isaksson, Conny; Nordin, Lars-Erik; Olsson, Curt; and Sahlin, Thorbjorn, to Aktiebolaget ASEA-ATOM. Transport device for reactor fuel rod cladding tubes. 3,960,263, Cl. 198-170.000.
Ishii, Morikatsu: *See—*
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Isobe, Mineo. Fire-extingushing equipment. 3,960,216, Cl. 169-48.000.
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Ivanov, Vladimir Maximovich: *See—*
Alexeev, Viktor Ivanovich; Emelyanov, Ivan Yakovlevich; Ivanov, Vladimir Maximovich; Konstantinov, Leonard Vasilievich; Lysikov, Boris Vasilievich; Postnikov, Viktor Viktorovich; and Rybakov, Jury Viktorovich, 3,961,196.
Iwasaki, Akio: *See—*
Tsujikawa, Masahiro; Ozasa, Minoru; Takagi, Fumio; Hirai, Katsumi; Iwasaki, Akio; Imamura, Hiroshi; and Ueda, Testuhiro, 3,960,507.
Iyengar, Rama, to Northern Electric Company Limited. Method of coating a glass fiber filament. 3,960,530, Cl. 65-3.00C.
J. M. Huber Corporation: *See—*
Wason, Satish K., 3,960,586.
J. Mustad AB: *See—*
Svahn, B. Knut Lennart; and Wersen, Lars Gustav Vilhelm, 3,960,359.
Jackson, Jay Warner: *See—*
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Jacob, Hans-Ludwig: *See—*
Hochheimer, Hans-Joachim; Haas, Hans; Jacob, Hans-Ludwig; Helling, Paul; and Wulk, Bernhard, 3,961,307.
Jacob, Solomon M.: *See—*
Gross, Benjamin; Jacob, Solomon M.; Nace, Donald M.; and Voltz, Sterling E., 3,960,707.
Jacobs, Emmett Smith; and Liberi, Vincent Edward, to Du Pont de Nemours, E. I., and Company. Muffler particulate trap for internal combustion engines. 3,960,528, Cl. 55-346.000.
Jacobs, Gerald L.: *See—*
Gee, Thomas A.; Jacobs, Gerald L.; and Baltare, Gunnar, 3,961,215.
Jacobs, Richard L., to Sherwin-Williams Company, The. N-monosubstituted-2,3-pyridinedicarboxamides, and related compounds. 3,960,877, Cl. 260-295.50A.
Jacoby, Jerold L.: *See—*
Schmidt, James L.; Jacoby, Jerold L.; Shaw, Garrett D.; and Bhuta, Pravin G., 3,960,448.
Jaffe, Wolfgang; and Porter, Oswald M., to Singer Company, The. Dual plunger solenoid. 3,961,298, Cl. 335-259.000.
Jagusch, Leonhard: *See—*
Liepe, Friedrich; Langhans, Gerhard; Jagusch, Leonhard; Richter, Klaus; and Schlaf, Guenter, 3,960,175.
Jakobsen, William J., to Lourdes Industries, Inc. Cannister arrangement of transducers to monitor pressures. 3,960,019, Cl. 73-420.000.
Janci, John. Energy-absorbing bumper system. 3,960,397, Cl. 293-86.000.
Japan Synthetic Rubber Co., Ltd.: *See—*
Tanaka, Hiroshi; Tanaka, Takuo; and Tanaka, Takeshi, 3,960,771.
Jarvis, John Frederick, to Bell Telephone Laboratories, Incorporated. Bi-level display system. 3,961,134, Cl. 178-7.30D.
Jasinski, Stanley C.: *See—*
Windsor, Robert N.; and Jasinski, Stanley C., 3,960,189.
Jefferson Chemical Company, Inc.: *See—*
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Jelenic, Bronko F.: *See—*
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Jelinek, Ronald H., to International Telephone and Telegraph Corporation. Voltage controlled oscillator driver. 3,961,285, Cl. 332-16.00T.
Jenaer Glaswerk Schott & Gen.: *See—*
Krolla, Georg, 3,960,578.
Jenkins, Garry W. Combination ash tray and chewed gum disposal package. 3,960,269, Cl. 206-233.000.
Jennings, David Michael: *See—*
Elstow, William Rupert Brooke; and Jennings, David Michael, 3,961,259.
Jetco, Inc.: *See—*
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Jett, Marion Barney; Jackson, Jay Warner; and Irby, Richard Eugene, to Dresser Industries, Inc. Well flow sensing apparatus. 3,960,015, Cl. 73-155.000.
Jezo, Maurice Leon: *See—*
Zlydak, Valentine John; and Jezo, Maurice Leon, 3,961,271.
John Wyeth & Brother, Ltd.: *See—*
Curran, Adrian Charles Ward, 3,960,876.
Johns-Manville Corporation: *See—*
O'Connor, John Vincent; and Zolnick, Edmund Joseph, 3,960,472.
Johns, Robert W., to World Oil Mining Ltd. Tunnel layout for longwall mining using shields. 3,960,408, Cl. 299-19.000.
Johnson, Craig E.; and Luense, John R., to United States of America, Navy. Method for extruding solventless gun powder. 3,960,993, Cl. 264-3.00B.
Johnson, Doyle F.: *See—*
Harris, Barron M., Sr.; and Johnson, Doyle F., 3,960,111.

Johnson, Hiram K. Carrier apparatus. 3,960,398, Cl. 294-16.000.

Johnson, James R.: *See—*
Close, James R.; Wood, William P.; Hatch, Robert A.; and Johnson, James R., 3,959,865.

Johnson, Melvin Harry: *See—*
Boyle, Edward Michael Joseph; and Johnson, Melvin Harry, 3,960,305.

Johnston, Harlin D.: *See—*
Bertus, Brent J.; Farha, Floyd, Jr.; and Johnston, Harlin D., 3,960,773.

Johnston, Loren Bainum: *See—*
Harris, David Isaac; and Johnston, Loren Bainum, 3,961,100.

Jonason, Karl Gunnar. Apparatus for affixing surface enlarging members in the form of coherent transversally corrugated metal strips to elongate metal basic profiles. 3,960,308, Cl. 228-5.100.

Jones, Calvin, to Dairylea Cooperative Inc. Sampling apparatus. 3,960,021, Cl. 73-425.40R.

Jones, David H.: *See—*
Bohanan, Charles S.; Jones, David H.; Raab, Harry F., Jr.; and Radkowsky, Alvin, 3,960,655.

Jones, Eileen; Morris, Arthur; Thomas, Ieuan; and Traynor, James Rodney, to Imperial Chemical Industries, Inc. Catalytic preparation of polyamides from bis(aminophenyl)sulphone. 3,960,819, Cl. 260-78.00R.

Jones, Robert W.; and Hall, James K., to United States of America, Navy. Noise riding threshold. 3,961,274, Cl. 328-165.000.

Jonker, Hendrik: *See—*
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Jordan, Gene M.; Eisenhardt, Robert G.; and Douthat, Dean Z., to First Ann Arbor Corporation. Method of classifying fingerprints. 3,959,884, Cl. 33-1.0BB.

Jorgensen, Hemming Kristian, to Dansk Industri Syndikat A/S. Foundry equipment. 3,960,202, Cl. 164-325.000.

Joseph Galkin Corporation: *See—*
Block, Charles, 3,960,097.

Jouanneault, Jean-Pierre, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Method of forming a printed circuit with means for preventing accumulation of metal alloy. 3,959,876, Cl. 29-628.000.

Jung, Michel: *See—*
Metcalf, Brian Walter; and Jung, Michel, 3,960,927.

Jung, Werner; and Knuth, Kurt E., to Teletype Corporation. Disposable ink supply and nozzle system using a simple pump. 3,961,337, Cl. 346-140.00R.

Juntgen, Harald; Knoblauch, Karl; Gappa, Gunther; and Schwarte, Jurgen, to Bergwerksverband GmbH. Apparatus for removing sulfur oxide from exhaust gases. 3,960,529, Cl. 55-390.000.

Juntgen, Harald: *See—*
Munzner, Heinrich; Heimbach, Heinrich; Korbacher, Werner; Peters, Werner; Juntgen, Harald; Knoblauch, Karl; and Zundorf, Dieter, 3,960,522.
Munzner, Heinrich; Heimbach, Heinrich; Korbacher, Werner; Peters, Werner; Juntgen, Harald; Knoblauch, Karl; and Zundorf, Dieter, 3,960,769.

Jurisch, Louis A., to Commercial Solvents Corporation. Process for the preparation of a no-bake sand core from an oxazoline condensate as binder. 3,960,816, Cl. 260-73.00L.

K/Tronic Inc.: *See—*
Shapley, Bruce D., 3,960,338.

Kabs, Klaus: *See—*
Gaenzler, Wolfgang; Kabs, Klaus; and Schroeder, Guenter, 3,960,934.

Kabushiki Kaisha Ricoh: *See—*
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Kabushiki Kaisha Suwa Seikosha: *See—*
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Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See—*
Mori, Mitsuo; and Ohashi, Kengo, 3,960,024.

Kader, Reiner, to Mauser Kommanditgesellschaft. Apparatus for manufacturing reinforced plastic containers by blow molding. 3,960,474, Cl. 425-503.000.

Kaelin, Joseph Richard. Method of processing refuse and/or sludge and a plant for carrying out the method. 3,960,537, Cl. 71-9.000.

Kaiser, Carl; and Ross, Stephen T., to SmithKline Corporation. α-Aminoalkyl-4-hydroxy-3-alkylsulfonylmethylbenzyl alcohols having β-adrenergic stimulant activity. 3,961,076, Cl. 424-330.000.

Kaiser, Hermann: *See—*
Burger, Alex; Kaiser, Hermann; and Ludovici, Werner, 3,960,761.

Kaiser, Rudolf: *See—*
Ripperger, Willi; Oettinger, Willi; Kaiser, Rudolf; Pfitzner, Klaus; and Palm, Richard Adolf, 3,960,768.

Kajima Corporation: *See—*
Sato, Kuniaki; Toyama, Kozo; Saheki, Toshio; Mizukoshi, Kaoru; and Suzuki, Shuei, 3,960,458.

Kaku, Katsuo; Yoshimura, Hirofumi; Yada, Hiroshi; and Yamada, Naoomi, to Nippon Steel Corporation. Method for producing a low temperature high strength tough steel. 3,960,612, Cl. 148-12.00F.

Kalyazin, Evgeny Petrovich: *See—*
Baranova, Rimma Bronislavovna; Lazarev, Vladimir Ilich; Mironov, Nikolai Petrovich; Pinaev, Viktor Alexandrovich; Bugaenko, Lenar Timofeevich; Kalyazin, Evgeny Petrovich; Panferova, Alexandra Timofeevna; Byakov, Vsevolod Mikhailovich; Nikeshichev, Jury Nikolaevich; and Petryaev, Petrovich Evgeny, 3,960,682.

Kamisaka, Kosei: *See—*
Okuno, Noboru; Kamogawa, Toshiro; and Kamisaka, Kosei, 3,961,359.

Kamiya, Osamu; and Itoh, Susumu, to Canon Kabushiki Kaisha. Anti-reflection coating having pseudo-inhomogeneous layers. 3,960,441, Cl. 350-164.000.

Kammerer, Edwin G. Rotary engine. 3,960,117, Cl. 123-8.490.

Kamogawa, Toshiro: *See—*
Okuno, Noboru; Kamogawa, Toshiro; and Kamisaka, Kosei, 3,961,359.

Kamoshita, Katsuo: *See—*
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Kanebo, Ltd.: *See—*
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Kaneda, Kazuhisa: *See—*
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Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See—*
Isukamoto, Hiroji; Morikawa, Hisashi; Nakagawa, Masao; Kato, Shinji; Miyamoto, Masaki; Yoda, Toichiro; and Yoshihara, Katsuhiko, 3,960,787.

Kang, Kenneth Suk; and McNeely, William H. Polysaccharide and bacterial fermentation process for its preparation. 3,960,832, Cl. 260-209.00R.

Kansai Paint Company, Ltd.: *See—*
Kondo, Taizo; Matsui, Komaharu; and Yamamoto, Kunio, 3,960,791.
Miyosawa, Yoshiaki; and Umemoto, Sueo, 3,960,676.

Kao Soap Co., Ltd.: *See—*
Homma, Itomi; Mino, Junryo; and Kunikawa, Kenzo, 3,960,744.
Murata, Moriyasu; Yamanaka, Makoto; and Sai, Fumio, 3,960,780.
Nakagawa, Yunosuke; and Sato, Koitsu, 3,960,743.

Karoll, Elizabeth A.: *See—*
Evers, William J.; Heinsohn, Howard H., Jr.; Mayers, Bernard J.; and Karoll, Elizabeth A., 3,961,093.

Karosas, Raymond: *See—*
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Kasper, Willi: *See—*
Licht, Helmut; and Kasper, Willi, 3,960,400.

Kaster, Robert L. Heart valve prosthesis. 3,959,827, Cl. 3-1.500.

Katchman, Arthur, to General Electric Company. Polyphenylene ether composition. 3,960,808, Cl. 260-42.180.

Kato, Shinji: *See—*
Isukamoto, Hiroji; Morikawa, Hisashi; Nakagawa, Masao; Kato, Shinji; Miyamoto, Masaki; Yoda, Toichiro; and Yoshihara, Katsuhiko, 3,960,787.

Katz, Ira; Wilson, Richard A.; Evers, William J.; Vock, Manfred H.; and Verhoeve, Gerrit W., to International Flavors & Fragrances Inc. 2-Methyl-5,7-dihydrothieno-[3,4d]-pyrimidine. 3,960,860, Cl. 260-251.00A.

Kauffman, Robert N.: *See—*
Smith, James D. B.; and Kauffman, Robert N., 3,960,803.

Kaufmann Window and Door Corporation: *See—*
Noecker, Marshall V.; Thom, Kenneth C.; and Harp, Charles, Jr., 3,959,926.

Kaulig, Heinz; and Orth, Gerhard, to Vorwerk & Co. Elektrowerke KG. Floor cleaning apparatus. 3,959,847, Cl. 15-368.000.

Kaveloski, Robert J. Prefabricated disposable fly trap. 3,959,914, Cl. 43-118.000.

Kavesh, Sheldon, to Allied Chemical Corporation. Apparatus for liquid quenching of free jet spun metal. 3,960,200, Cl. 164-281.000.

Kawada, Seigo: *See—*
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Kawakami, Yorisada: *See—*
Kuwagata, Masahiro; Yamada, Masao; Nakamura, Kenichiro; and Kawakami, Yorisada, 3,961,354.

Kawamata, Naoyuki: *See—*
Morita, Tomijiro; Kobayashi, Akio; Funahashi, Isao; Matsuda, Toshiharu; Naoki, Makoto; Kawamata, Naoyuki; and Fukui, Jun, 3,961,021.

Kawamura, Kiyoshi: *See—*
Nagai, Yohei; and Kawamura, Kiyoshi, 3,960,044.

Kawamura, Masanori, to Nohmi Bosai Kogyo Co. Ltd. Gas detector using gas sensing elements exhibiting different response characteristics. 3,961,248, Cl. 324-71.0SN.

Kawamura, Masao; Ito, Kazuhiro; Morioka, Makoto; Ono, Yuichi; Ishioka, Sachio; and Kurata, Kazuhiro, to Hitachi, Ltd. Epitaxial growth process for compound semiconductor crystals in liquid phase. 3,960,618, Cl. 148-171.000.

Kawamura, Yoshikazu: *See—*
Koike, Kenichi; and Kawamura, Yoshikazu, 3,961,213.

Kawanishi, Toshiyuki, to Kabushiki Kaisha Ricoh. Negatively charged liquid developer for use in electrostatic photography. 3,960,737, Cl. 252-62.10L.

Kawasaki, Hideo: *See—*
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Kawase, Shoji: *See—*
Kuratsuji, Takatoshi; Kawase, Shoji; Shima, Takeo; Shimotsuma, Sakae; and Hosoi, Masahiro, 3,961,008.

Kayano, Masanori: *See—*
Konishi, Toji; Kayano, Masanori; and Tanabe, Yoshio, 3,961,064.

Kazimierski, Zbyszko Kazimierz: *See*—
Brzeski, Lech Andrzej; Kazimierski, Zbyszko Kazimierz; Krysinski, Jan Eugeniusz; and Siwek, Andrzej Witold, 3,960,414.

KDI Sylvan Pools, Inc.: *See*—
van den Broek, William A., 3,959,830.

Keblys, Kestutis A.: *See*—
Kleiman, Joseph P.; and Keblys, Kestutis A., 3,961,033.

Keck, Jack L. Vehicle flow direction vanes. 3,960,402, Cl. 296-1.00S.

Kecskemethy, Geza: *See*—
Pataki, Zsuzsa, nee Nagy; Windisch, Ferenc; Nagy, Jozsef; Kecskemethy, Geza; and Virag, Gyorgy, 3,960,630.

Kegler, William H.; and Huyser, Marvin E., to Continental Oil Company. Manufacture of isotropic delayed petroleum coke. 3,960,704, Cl. 208-50.000.

Keifer, Siegfried: *See*—
Knickel, Birger; Keifer, Siegfried; Perrey, Hermann; Rudolph, Hans; Rosenkranz, Hans Jurgen; and Rudisch, Reinhold, 3,960,590.

Keihs, Karl; Adolphi, Heinrich; and Huber, Rolf, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Succinic acid oximidophosphoric esters. 3,960,885, Cl. 260-326.50A.

Keijzer, Johan H.; Pierle, Willy R. J.; and Van de Voorde, G., to Monroe Belgium N.V. Leveling system. 3,960,385, Cl. 280-692.000.

Kelley, Joseph M.; and Miskel, John J., Jr., to Dart Industries Inc. Process for producing high melt flow poly-olefin polymers. 3,960,987, Cl. 260-878.00B.

Kelley, Zar W. Device for mixing gases with liquids. 3,960,164, Cl. 137-202.000.

Kelly, Ralph; and Ritter, Edmond Jean, to Cincinnati Milacron, Inc. Skin protective compositions. 3,961,044, Cl. 424-78.000.

Kelsey-Hayes Company: *See*—
Tribe, Leonard T., 3,960,248.

Kemp, John Edward Glyn: *See*—
Cox, David Alexander; Danilewicz, John Christopher; Ham, Allan Leslie; Kemp, John Edward Glyn; and Snarey, Michael, 3,961,072.
Danilewicz, John Christopher; Kemp, John Edward Glyn; and Wright, James Robert, 3,960,861.

Kempster, George A. Method of making records. 3,960,634, Cl. 156-277.000.

Kendall Company, The: *See*—
Samour, Carlos M., 3,960,935.

Kendall, Larry J.; and Snyder, Larry D., to Fairchild Camera and Instrument Corporation. Multiple channel analog-to-digital converter with automatic calibration. 3,961,325, Cl. 340-347.0CC.

Kennametal Inc.: *See*—
Leibee, Donald L.; Oaks, Seibert S.; and Evans, R. Douglas, Jr., 3,960,222.

Kennecott Copper Corporation: *See*—
Agarwal, Jagdish Chandra; Giberti, Richard Andre; and Petrovic, Louis John, 3,960,513.

Kent, Eric George; and Walker, John, to Polysar Limited. Vulcanization of bromobutyl. 3,960,988, Cl. 260-879.000.

Kermans, Jasper J.: *See*—
Weiner, Philip D.; and Kermans, Jasper J., 3,961,090.

Kern, Thomas W.: *See*—
Champion, Fred; and Kern, Thomas W., 3,960,694.

Kerschner, James J., to Acme Highway Products Corporation. Sealing member. 3,960,462, Cl. 404-64.000.

Kett Electric Laboratory: *See*—
Toki, Kuni, 3,961,247.

Kettlestrings, John S. Propelled disk copter toy. 3,959,915, Cl. 46-74.00D.

Keuffel & Esser Company: *See*—
Baker, Allister L.; and Kooi, J. Peter E., 3,959,888.

Keuro Maschinenbau Gesellschaft mit beschrankter Haftung & Co. Kommanditgesellschaft: *See*—
Stolzer, Paul, 3,960,280.

Keyworth, Donald A.: *See*—
Sudduth, Jerome R.; and Keyworth, Donald A., 3,960,910.

Khadzhi, Valentin Evstafievich: *See*—
Butuzov, Vladimir Petrovich; Vatolkin, Evgeny Konstantinovich; Gordienko, Leonid Alexandrovich; Feldman, Ernst Borisovich; Khadzhi, Valentin Evstafievich; and Shaposhnikov, Anatoly Alexandrovich, 3,960,501.

Khanna, Rakesh, to Litton Business Systems, Inc. Temperature compensation for regulator circuit. 3,961,208, Cl. 307-297.000.

Khanna, Ram Tirth, to Du Pont de Nemours, E. I., and Company. High solids can coating compositions based on epoxy resin crosslinking agent, flexibilizing polyol, co-reactive acid catalyst, and surface modifier. 3,960,979, Cl. 260-834.000.

Khanna, Sarwan Kumar, to RCA Corporation. Disc record and method of compounding disc record composition. 3,960,790, Cl. 260-23.0XA.

Kiddie Products, Inc.: *See*—
Panicci, Richard L., 3,960,289.

Kielsmeier, Lester O., to Leprino Cheese Manufacturing Company. Pasta filata cheese production by stored curd process. 3,961,077, Cl. 426-36.000.

Kierstead, Richard Wightman: *See*—
Guthrie, Robert William; and Kierstead, Richard Wightman, 3,960,933.

Kikkoman Shoyu Co., Ltd.: *See*—
Sugimoto, Hiroshi; Takeuchi, Hiroyuki; and Yokotsuka, Tamotsu, 3,961,080.

Kikusui Kagaku Kogyo Kabushiki Kaisha: *See*—
Ichigo, Minoru; Suzuki, Takeshi; and Harada, Katsumasa, 3,960,108.

Kim, Young Dae, to Hewlett-Packard Company. Reflection type phase modulator having reduced temperature sensitivity and reduced distortion. 3,961,286, Cl. 332-22.000.

Kimberly-Clark Corporation: *See*—
Thomas, Gordon D., 3,961,119.

Kinder, Mark Russell, to TRW Inc. Hydraulic motor brake. 3,960,470, Cl. 418-61.00B.

Kiner, Gerald T.: *See*—
Anderson, Harold E.; and Kiner, Gerald T., 3,960,128.

Kino, Yoshihiro, to Matsushita Electric Industrial Co., Ltd. Ultrasonic delay material. 3,961,289, Cl. 333-30.00R.

Kirch, William: *See*—
Aboutboul, Henri A.; Kirch, William; and Krekeler, Jerome H., 3,960,826.

Kircher, Morton S.; and Engler, Maynard F., to Olin Corporation. Diaphragm cell having uniform and minimum spacing between the anodes and cathodes. 3,960,697, Cl. 204-252.000.

Kirk, Donald C., Jr.; and Morin, Otto, to Litton Systems, Inc. Harness cable connector. 3,960,425, Cl. 339-17.00R.

Kirkhof Manufacturing Corporation: *See*—
Medendorp, Roger L., 3,960,471.

Kirkpatrick, James W.; Porter, W. Fergus; and Shepherd, William E., to Youngstown Sheet and Tube Company. Steelmaking process. 3,960,547, Cl. 75-60.000.

Kishimoto, Tozo. High viscous dyeing sizing material producing machine. 3,960,368, Cl. 259-10.000.

Kitagawa, Sumio: *See*—
Maruyama, Isamu; Yamamoto, Hisao; Nakao, Masaru; Sakai, Shigeru; Sasajima, Kikuo; Kitagawa, Sumio; and Inaba, Shigeho, 3,960,873.

Klanderman, Bruce H.; and Klingbiel, Richard T., to Eastman Kodak Company. Nematic liquid crystal compositions. 3,960,748, Cl. 252-299.000.

Klanderman, Bruce H.; and Maier, David P., to Eastman Kodak Company. Liquid crystal compositions. 3,960,752, Cl. 252-299.000.

Kleiman, Joseph P.; and Keblys, Kestutis A., to Ethyl Corporation. Preparation of bromine. 3,961,033, Cl. 423-502.000.

Klein, Charles, to United Merchants and Manufacturers, Inc. Method for texturizing flocked fabric and fabric produced thereby. 3,961,115, Cl. 428-88.000.

Klein, Charles, to United Merchants and Manufacturers, Inc. Novel flocked fabric. 3,961,116, Cl. 428-90.000.

Klein, Edward I., to V-Mark Automation Ltd. Continuous motion assembly machine. 3,959,870, Cl. 29-208.00R.

Kleine, Werner, to Gebrueder Heller. Drill for rock. 3,960,223, Cl. 175-385.000.

Klenk, Ludwig: *See*—
Hammer, Klaus-Dieter; Porrmann, Herbert; and Klenk, Ludwig, 3,961,107.

Klenk, Peter: *See*—
Gutlhuber, Johann; Muhlner, Karl; and Klenk, Peter, 3,961,013.

Klett, Gene Ralph, to Caterpillar Tractor Co. High strength earth working penetration tooth. 3,959,901, Cl. 37-142.00R.

Klingbiel, Richard T.: *See*—
Klanderman, Bruce H.; and Klingbiel, Richard T., 3,960,748.

Klint, Bernard C., to Nylint Corporation. Toy vehicle with operator-simulating doll. 3,959,921, Cl. 46-202.000.

Klockner-Humboldt-Deutz Aktiengesellschaft: *See*—
Strauss, Werner, 3,960,714.

Kloenne, Ernest F.; and Patel, Kanti D., to P. R. Mallory & Co., Inc. Audible alarm for a synchronous motor. 3,961,327, Cl. 340-402.000.

Klose, Peter H.; and Ovshinsky, Stanford R., to Energy Conversion Devices, Inc. Structure and method for producing an image. 3,961,314, Cl. 340-173.0LS.

Kmetz, Tibor: *See*—
Dobias, Robert M.; Kmetz, Tibor; and Warnell, Walter C., 3,960,099.

Knapp, Philip B., to Minnesota Mining and Manufacturing Company. Apparatus for singulating and depositing seeds. 3,960,292, Cl. 221-211.000.

Knepper, Ronald W.: *See*—
Abbas, Shakir A.; Chang, Chi S.; Freeman, Leo B., Jr.; and Knepper, Ronald W., 3,961,355.

Knickel, Birger; Keifer, Siegfried; Perrey, Hermann; Rudolph, Hans; Rosenkranz, Hans Jurgen; and Rudisch, Reinhold, to Bayer Aktiengesellschaft. Modified chromium oxide pigment. 3,960,590, Cl. 106-302.000.

Knight, Arthur R.: *See*—
Verma, Arun; and Knight, Arthur R., 3,960,494.

Knoblauch, Karl: *See*—
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Munzner, Heinrich; Heimbach, Heinrich; Korbacher, Werner; Peters, Werner; Juntgen, Harald; Knoblauch, Karl; and Zundorf, Dieter, 3,960,522.
Munzner, Heinrich; Heimbach, Heinrich; Korbacher, Werner; Peters, Werner; Juntgen, Harald; Knoblauch, Karl; and Zundorf, Dieter, 3,960,769.

Knoche, Hubert Wilhelm: *See*—
Bernard, Jean Rene; Brunel, Daniel Elie; Commeyras, Auguste Andre; Coste, Camille Michel; Itier, Jean Joseph; and Knoche, Hubert Wilhelm, 3,960,764.

Knollmueller, Karl O., to Olin Corporation. Halogenated alkoxysilane intermediate compounds and their preparation. 3,960,913, Cl. 260-448.8OR.
Knorr, Atlee M.: *See*—
LaRocco, Thomas C.; and Knorr, Atlee M., 3,960,066.
Knuth, Kurt E.: *See*—
Jung, Werner; and Knuth, Kurt E., 3,961,337.
Kobari, Sadami: *See*—
Morishita, Masataka; Inaba, Yoshihito; Fukushima, Mitsuru; Hattori, Yoshinori; Kobari, Sadami; and Matsuda, Tetsuo, 3,960,757.
Kobayashi, Akio: *See*—
Morita, Tomijiro; Kobayashi, Akio; Funahashi, Isao; Matsuda, Toshiharu; Naoki, Makoto; Kawamata, Naoyuki; and Fukui, Jun, 3,961,021.
Kobayashi, Hidehiko: *See*—
Ibata, Jyoji; Kobayashi, Hidehiko; Toyomoto, Kazuo; Suzuoki, Kazuhiro; Hayashi, Yoshio; and Kurihara, Masakazu, 3,960,572.
Kobayashi, Kenji: *See*—
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Kobe Inc.: *See*—
Brown, Francis B.; and Erickson, John W., 3,960,319.
Kobylarz, Lawrence P.; and Mack, Ronald H., to Burroughs Corporation. Vibration absorption system for a card reading mechanism. 3,961,371, Cl. 360-101.000.
Koch, Ronney R.: *See*—
Cole, Robert Clay; Koch, Ronney R.; and Ramos, Joseph, 3,960,801.
Kochsmeier, Hans-Hermann, to Blaupunkt-Werke GmbH. FM discriminator circuit. 3,961,275, Cl. 329-107.000.
Kohan, Melvin Ira, to Du Pont de Nemours, E. I., and Company. Composition of oxymethylene polymer and amide oligomers. 3,960,984, Cl. 260-857.00F.
Kohanzadeh, Youssef; and Smith, Roy E., to Corning Glass Works. Method and apparatus for splicing optical fibers. 3,960,531, Cl. 65-4.00B.
Kohl, Charles F., Jr., to Dow Corning Corporation. Acetoxysiloxane adhesion promoter and primer composition. 3,960,800, Cl. 260-32.8SB.
Kohlmuller, Hans, to Siemens Aktiengesellschaft. Filter press-type fuel cell battery. 3,960,598, Cl. 136-86.00R.
Kohn, Gustave K., special administrator: *See*—
Brown, Melancthon S., deceased, 3,960,943.
Kohzai, Hayao, to Hitachi, Ltd. Color pickup tubes. 3,961,363, Cl. 358-43.000.
Koide, Hiroshi: *See*—
Konomi, Toshiaki; and Koide, Hiroshi, 3,960,118.
Koike, Kenichi; and Kawamura, Yoshikazu, to Kabushiki Kaisha Suwa Seikosha. Motion transformer. 3,961,213, Cl. 310-104.000.
Koizumi, Shun: *See*—
Kometani, Yutaka; Koizumi, Shun; Kubota, Kazuo; and Nawazima, Takeaki, 3,960,651.
Kokal, August, Jr. Bite intensity detecting articulating paper. 3,959,881, Cl. 32-19.000.
Kollar, John: *See*—
Russell, Joseph Lee; and Kollar, John, 3,960,954.
Kolly, Joseph M.: *See*—
Haining, Frank W.; Kolly, Joseph M.; and Lynch, Thomas E., Jr., 3,960,561.
Komai, Hisataka; and Ishikawa, Atsuo, to Nippon Zeon Co., Ltd. Hydrocarbon resins and compositions thereof. 3,960,823, Cl. 526-237.000.
Kometani, Eiji; Imai, Masaya; and Hazaki, Eiichi, to Hitachi Construction Machinery Co., Ltd. Hydraulic pump or motor. 3,960,057, Cl. 92-160.000.
Kometani, Yutaka; Koizumi, Shun; Kubota, Kazuo; and Nawazima, Takeaki, to Daikin Kogyo Co., Ltd. Reinforced air-pervious polytetrafluorothylene sheet. 3,960,651, Cl. 162-105.000.
Kondo, Taizo; Matsui, Komaharu; and Yamamoto, Kunio, to Kansai Paint Company, Ltd. Powder coating composition for electrodeposition. 3,960,791, Cl. 260-23.0AR.
Kondo, Tokiharu: *See*—
Sucyoshi, Tohru; Nakazawa, Yoshiyuki; Nakamura, Yoshuhara; Ohi, Reiichi; and Kondo, Tokiharu, 3,960,568.
Konishi, Toji; Kayano, Masanori; and Tanabe, Yoshio, to Eisai Co., Ltd. Pharmaceutical composition for remedy of hyperammoniemia. 3,961,064, Cl. 424-266.000.
Kono, Kimio: *See*—
Goshima, Takeshi; Sugiura, Yoshinori; Endo, Kiyonobu; Sato, Hideaki; Kono, Kimio; and Tsuji, Takao, 3,960,443.
Kono, Osamu; Tsuchiya, Noboru; Matsuda, Atsushi; and Yoshida, Kiichi, to Sony Corporation. Power supply circuit for use with an electrostatic transducer. 3,961,202, Cl. 307-150.000.
Konomi, Toshiaki; and Koide, Hiroshi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Air-fuel ratio adjusting device in an internal combustion engine having a carburetor. 3,960,118, Cl. 123-32.0EA.
Konstantinov, Leonard Vasilievich: *See*—
Alexeev, Viktor Ivanovich; Emelyanov, Ivan Yakovlevich; Ivanov, Vladimir Maximovich; Konstantinov, Leonard Vasilievich; Lysikov, Boris Vasilievich; Postnikov, Viktor Viktorovich; and Rybakov, Jury Viktorovich, 3,961,196.
Kooi, Else, to U.S. Philips Corporation. Integrated circuit with oxidation-junction isolation and channel stop. 3,961,356, Cl. 357-50.000.
Kooi, J. Peter E.: *See*—
Baker, Allister L.; and Kooi, J. Peter E., 3,959,888.
Koppe, Herbert; Engelhardt, Albrecht; and Zeile, Karl, to Boehringer Ingelheim GmbH. Therapeutic compositions and method. 3,961,071, Cl. 424-319.000.
Koppers Company, Inc.: *See*—
Greco, Nicholas P.; and Webb, David A., 3,960,969.
Korbacher, Werner: *See*—
Munzner, Heinrich; Heimbach, Heinrich; Korbacher, Werner; Peters, Werner; Juntgen, Harald; Knoblauch, Karl; and Zundorf, Dieter, 3,960,522.
Munzner, Heinrich; Heimbach, Heinrich; Korbacher, Werner; Peters, Werner; Juntgen, Harald; Knoblauch, Karl; and Zundorf, Dieter, 3,960,769.
Koros, Robert M.: *See*—
Bessant, Glyndwr A. R.; Eichamer, Paul D.; Koros, Robert M.; and Schieni, Steven R., 3,960,508.
Kosuge, Yoshio: *See*—
Oishi, Yasushi; Ohi, Reiichi; and Kosuge, Yoshio, 3,960,570.
Kourkene, Jacques P. Method for prestressing a body of ceramic material. 3,960,995, Cl. 264-27.000.
Kraftwerk Union Aktiengesellschaft: *See*—
Hiller, Sigwart; and Schad, Harald, 3,961,189.
Hintergraber, Maximilian, 3,960,034.
Krajewski, James C.: *See*—
Hartleroad, Ronald J.; Krajewski, James C.; and Rayon, Ronald G., 3,960,279.
Kramer, Daniel E. Dual voltage forced air heat exchanger. 3,959,979, Cl. 62-89.000.
Kramer, Wolfgang; Draber, Wilfried; Hammann, Ingeborg; and Scheinpflug, Hans, to Bayer Aktiengesellschaft. Pesticidal 2-amidocarbonylthiobarbituric acids. 3,961,061, Cl. 424-254.000.
Krapcho, John; and Turk, Chester Frank, to E. R. Squibb & Sons, Inc. 2-Aminoalkyl-3a,4,5,6,7,8-hexahydro-3-phenyl-8-(phenylmethylene)-cyclopenta[c]pyrazoles. 3,960,848, Cl. 260-240.00F.
Kratky, Frank, to Westguard Products, Inc. Animal restraint. 3,960,113, Cl. 119-99.000.
Kraus, Andreas: *See*—
Siemes, Franz; Kraus, Andreas; and Buhl, Joachim, 3,960,063.
Kraus, Charles Edward, to Excelermatic, Inc. Hydrostatic axial thrust bearing. 3,960,417, Cl. 308-170.000.
Kreiner, Philipp: *See*—
Schmitt, Walti; and Kreiner, Philipp, 3,960,991.
Krekeler, Jerome H.: *See*—
Aboutboul, Henri A.; Kirch, William; and Krekeler, Jerome H., 3,960,826.
Kremer, Richard K.; and Zeblisky, Rudolph J., to Photocircuits Division of Kollmorgen Corporation. Sensitizers and process for electroless metal deposition. 3,961,109, Cl. 427-304.000.
Krichevsky, Efrem Julievich: *See*—
Fridlyander, Iosif Naumovich; Yatsenko, Konstantin Petrovich; Nekrasova, Galina Anatolievna; Gulin, Alexandr Nikolaevich; Semenova, Zoya Grigorievna; Sidorov, Nikolai Grigorievich; Morozov, Boris Sergeevich; Krichevsky, Efrem Julievich; Zakharova, Tatyana Alexandrovna; and Sarycheva, Raisa Grigorievna, 3,960,551.
Kroebel, Reinhard; and Meyer, Alfred, to Bayer Aktiengesellschaft. Production of absorbents. 3,960,762, Cl. 252-426.000.
Krolla, Georg, to Jenaer Glaswerk Schott & Gen. Arsenic pentoxide glasses. 3,960,578, Cl. 106-47.00Q.
Krosnar, Thomas Charles: *See*—
Gasson, Edward James; Krosnar, Thomas Charles; and Marrian, Stanley Frederic, 3,960,925.
Kruger, Leo: *See*—
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Krumm, Stephen H.: *See*—
Bailey, William R.; Krumm, Stephen H.; and Marach, David R., 3,960,435.
Kruppa, Richard F.; and Coleman, Arthur Edward, to Applied Science Laboratories, Inc.; and Silar Laboratories, Inc. High temperature polar stationary phase for gas chromatograhy. 3,960,521, Cl. 55-67.000.
Krysinski, Jan Eugeniusz: *See*—
Brzeski, Lech Andrzej; Kazimierski, Zbyszko Kazimierz; Krysinski, Jan Eugeniusz; and Siwek, Andrzej Witold, 3,960,414.
Kubota, Kazuo: *See*—
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Kudo, Shinji, to Yodogawa Steel Works, Limited. Method of making a laminated metal-based facing. 3,960,639, Cl. 156-222.000.
Kuffer, Fernand Bannie, to General Dynamics Corporation. Beam directing system having a moveable low mass inertia beam folding optical element. 3,961,179, Cl. 250-203.00R.
Kuhla, Donald E.; and Sarges, Reinhard, to Pfizer Inc. Benzenesulfonylurea derivatives. 3,961,065, Cl. 424-266.000.
Kuhla, Donald E.; Sarges, Reinhard; and Wiedermann, Hans E., to Pfizer Inc. Composition comprising a benzenesulfonylurea hypoglycemic agent and method of treatment. 3,961,067, Cl. 424-270.000.
Kuhlmann-Schafer, Wilhelm H., to Preussag Aktiengesellschaft. Zone melting process. 3,960,511, Cl. 23-301.0SP

Kuhn, William E., to Hemotec, Inc. Method and means for the repair of peripheral nerves. 3,960,151, Cl. 128-334.00R.

Kukolja, Stjepan; and Lammert, Steven R., to Eli Lilly and Company. Preparation of 6-acylamino-2-methyl-2-halomethyl penams. 3,960,844, Cl. 260-239.100.

Kukolja, Stjephan P.; and Lammert, Steven R., to Eli Lilly and Company. Preparation of desacetoxy-cephalosporin sulfoxides from penicillin sulfoxides. 3,960,851, Cl. 260-243.00C.

Kuligowski, Gerd; and Cattien, Eckart, to Siemens Aktiengesellschaft. Method and apparatus for obtaining a signal having a low harmonic content. 3,961,205, Cl. 307-261.000.

Kumiai Chemical Industry Co., Ltd.: *See*—
Horii, Tetsuo; Chiyomaru, Isao; Kawada, Seigo; and Takita, Kiyoshi, 3,961,049.

Kunikawa, Kenzo: *See*—
Homma, Itomi; Mino, Junryo; and Kunikawa, Kenzo, 3,960,744.

Kunstle, Gerhard; and Siegl, Herbert, to Wacker-Chemie GmbH. Process for preparing palladium(II)acetylacetonate. 3,960,909, Cl. 260-429.00J.

Kunststoffwerk Gerbruder Anger GmbH & Co.: *See*—
Gutlhuber, Johann; Muhlner, Karl; and Klenk, Peter, 3,961,013.

Kuntschik, Lawrence F.; and Rigdon, Orville W., to Texaco Inc. Purification process. 3,960,955, Cl. 260-566.00A.

Kurashiki Boseki Kabushiki Kaisha: *See*—
Suminokura, Toshihiko; Kyogoku, Yojuro; and Yasumoto, Noboru, 3,961,125.

Kurata, Hirotaka, to Sansui Electric Co., Ltd. Stereo signal demodulator in a four-channel stereo broadcast receiver comprising means for performing delay equalization together with sampling of a composite signal. 3,961,276, Cl. 329-112.000.

Kurata, Kazuhiro: *See*—
Kawamura, Masao; Ito, Kazuhiro; Morioka, Makoto; Ono, Yuichi; Ishioka, Sachio; and Kurata, Kazuhiro, 3,960,618.

Kuratsuji, Takatoshi; Kawase, Shoji; Shima, Takeo; Shimotsuma, Sakae; and Hosoi, Masahiro, to Teijin Limited. Process for preparing polyester shaped articles. 3,961,008, Cl. 264-178.00R.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Morita, Tomijiro; Kobayashi, Akio; Funahashi, Isao; Matsuda, Toshiharu; Naoki, Makoto; Kawamata, Naoyuki; and Fukui, Jun, 3,961,021.

Kurihara, Masakazu: *See*—
Ibata, Jyoji; Kobayashi, Hidehiko; Toyomoto, Kazuo; Suzuoki, Kazuhiro; Hayashi, Yoshio; and Kurihara, Masakazu, 3,960,572.

Kurihara, Masaru: *See*—
Yoda, Naoya; Yoshi-i, Toshiya; Fujita, Saburo; Mochizuki, Hiroshi; Yumoto, Hirosuke; Kurihara, Masaru; Kubota, Takashi; Dokoshi, Noriaki; and Tanaka, Chiaki, 3,961,009.

Kuroiwa, Katumasa: *See*—
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Kurschner, Dennis L.: *See*—
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Kuwabara, Kiyoaki: *See*—
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Kuwagata, Masahiro; Yamada, Masao; Nakamura, Kenichiro; and Kawakami, Yorisada, to Matsushita Electronics Corporation. Mesa type thyristor and its making method. 3,961,354, Cl. 357-39.000.

Kydonieus, Agis F.; and Smith, Inja, to Herculite Protective Fabrics Corporation. Antistatic carpet and method for manufacturing same. 3,961,117, Cl. 428-96.000.

Kyi, Roland R., to Olin Corporation. Preparation of 2-chloropyridine by hydrogenolysis. 3,960,869, Cl. 260-290.0HL.

Kyogoku, Yojuro: *See*—
Suminokura, Toshihiko; Kyogoku, Yojuro; and Yasumoto, Noboru, 3,961,125.

Kyono, Iwao: *See*—
Yasui, Hiroshi; Kyono, Iwao; Aoki, Hideo; and Manabe, Haruo, 3,961,031.

Lacey, Kathleen P., to Early California Industries, Inc. Corrosion-inhibited polyphosphate compositions. 3,960,735, Cl. 252-2.000.

Lach, Richard F., to United Technologies Corporation. Signal conditioning circuit for vehicle diagnostic system. 3,961,239, Cl. 324-15.000.

LaDon Corporation: *See*—
Hogan, Gary LaDon, 3,960,160.

Lafferty, William D.: *See*—
Port, David J.; Lafferty, William D.; and Cheney, Richard F., 3,960,545.

LaFleur, Bob A.: *See*—
O'Brien, Robert J.; Lelewski, Stanley, Jr.; and LaFleur, Bob A., 3,960,738.

Lagues, Michel; and Domange, Jean-Louis, to U.S. Philips Corporation. Method of manufacturing a non-thermally emitting electrode for an electric discharge tube. 3,960,421, Cl. 316-17.000.

Laing, Nikolaus. Storage body with latent storage substances for temperature equilization. 3,960,205, Cl. 165-48.000.

Laitala, Veikko A. Subsoil plow. 3,960,220, Cl. 172-261.000.

Lambooy, Guus. Transportable house, particularly of the caravan-type. 3,959,936, Cl. 52-65.000.

Lambou, Madeline G.; Spadaro, James J.; and Rusch, Eunice M., to United States of America, Agriculture. Agricultural foams as carriers for activated charcoal. 3,960,763, Cl. 252-428.000.

Lammert, Steven R.: *See*—
Kukolja, Stjepan; and Lammert, Steven R., 3,960,844.
Kukolja, Stjephan P.; and Lammert, Steven R., 3,960,851.

Lamping, Harold D.; and Myers, David M., to Curtiss-Wright Corporation. Stratified charge rotary engine (method of operation). 3,960,115, Cl. 123-8.090.

Landsman, Robert M., to Log Etronics Inc. Sequential image-modulated dot-area recording. 3,961,132, Cl. 178-6.70R.

Langhans, Gerhard: *See*—
Liepe, Friedrich; Langhans, Gerhard; Jagusch, Leonhard; Richter, Klaus; and Schlaf, Guenter, 3,960,175.

Lanier, Terry O.; and Ramanaiah, Nunna, to Corning Glass Works. pH reference electrode. 3,960,689, Cl. 204-195.00F.

Lankro Chemicals Group Limited: *See*—
Shackleton, Frank; and Butler, Donald, 3,960,948.

Larkin, John M.: *See*—
Duranleau, Roger G.; and Larkin, John M., 3,960,953.

LaRocco, Thomas C.; and Knorr, Atlee M., to Union Kol-Flo Corporation. Beverage preparation apparatus. 3,960,066, Cl. 99-323.200.

La Roy, Dick; and Tengbergen, Erik Adriaan Willem Van Ebbenhorst, to N.V. Hollandse Signaalapparaten. Method for the fabrication of printed circuits. 3,960,635, Cl. 156-286.000.

Larrabee, Robert Dean, to RCA Corporation. Fluorescent liquid crystals. 3,960,753, Cl. 252-299.000.

Latimer, Eugene E.; and Lorimor, Larry W., to Caterpillar Tractor Co. Hydraulic circuit with dual tank system and method for using the same. 3,960,174, Cl. 137-563.000.

Lau, Hung Wah Anthony, to Solartron Electronic Group Limited, The. Non linear network converting bipolar sawtooth signal into sinewave signal. 3,961,206, Cl. 307-261.000.

Laubie, Michel: *See*—
Malen, Charles; and Laubie, Michel, 3,960,891.

Laupman, Robert Ronald, to Novanex Automation N.V. Transistor amplifier. 3,961,278, Cl. 330-21.000.

Laurent, Henry: *See*—
Engel, Klaus; Prezewowsky, Klaus; Laurent, Henry; and Nishino, Yukishige, 3,960,841.
Haffer, Gregor; Eder, Ulrich; Laurent, Henry; Ruppert, Jurgen; Sauer, Gerhard; and Wiechert, Rudolf, 3,960,842.

Laurenz, Frank R. Animal facility equipment. 3,960,110, Cl. 119-28.000.

Lawford, Victor Nicholas; Granada, Richard Paul; and Elderton, Peter, to International Telephone and Telegraph Corporation. Flowmeter and function generator therefor. 3,960,033, Cl. 74-522.000.

Lawrence, John P., to Goodyear Tire & Rubber Company, The. Urea additives for sulfur vulcanizable polymers. 3,960,857, Cl. 260-246.00B.

Lawrence Peska Associates, Inc.: *See*—
Bhandia, B. S., 3,959,989.
Dawson, Stanford, 3,959,917.
Levkovski, Nikola, 3,960,092.
McCormick, John B., 3,960,231.
Meyer, Paul, 3,959,916.
Nos, Rudolph, 3,959,835.
Reynolds, Tom, 3,960,382.
Tesberg, Allan V., 3,960,159.

Lazarev, Vladimir Ilich: *See*—
Baranova, Rimma Bronislavovna; Lazarev, Vladimir Ilich; Mironov, Nikolai Petrovich; Pinaev, Viktor Alexandrovich; Bugaenko, Lenar Timofeevich; Kalyazin, Evgeny Petrovich; Panferova, Alexandra Timofeevna; Byakov, Vsevolod Mikhailovich; Nikeshichev, Jury Nikolaevich; and Petryaev, Petrovich Evgeny, 3,960,682.

Lazet, Frank J., to Philadelphia Quartz Company. Preparing alkali metal silicate glass with bubbles. 3,960,532, Cl. 65-22.000.

Lazzari, Jean-Pierre; and Melnick, Igor, to Commissariat a l'Energie Atomique; and Compagnie Internationale pour l'Informatique. Magnetic circuit having low reluctance. 3,961,299, Cl. 336-218.000.

Lear Siegler, Inc.: *See*—
Psenka, Joseph A.; and Tersch, Richard W., 3,960,055.
Strader, Don S.; Masser, Lloyd G.; and Lundwall, Robert J., 3,960,388.

Lebo, Willis R. Method and apparatus for treating liquid sewage and waste. 3,960,718, Cl. 210-14.000.

Lechleitner, Wilhelm: *See*—
Heitzinger, Friedrich; and Lechleitner, Wilhelm, 3,960,604.

Lectric Lite Company: *See*—
Blaylock, Arnold O., 3,961,174.

Ledermann, Hugo. Heat-pump system for hot-water room-heating. 3,959,986, Cl. 62-324.000.

Lednicer, Daniel, to Upjohn Company, The. 4'-Fluoro-4- [4-(phenyl)cyclohexyl]amino butyrophenones and the salts thereof. 3,960,961, Cl. 260-570.5CA.

Lee, David C., to Morehead, Charles D. Fishing lure. 3,959,912, Cl. 43-42.020.

Lee, John Davidson: *See*—
MacKenzie, Morley Scott; Charron, Louis Donald; Dooley, Andrew Philip Charles; and Lee, John Davidson, 3,960,431.

Lee, Kenneth M., to Dow Corning Corporation. Detergent resistant auto polish. 3,960,574, Cl. 106-3.000.

Leesona Corporation: *See*—
Chodosh, Stewart M., 3,960,600.

LeGrand, Donald G.: *See*—
Gaines, George L., Jr.; and LeGrand, Donald G., 3,961,122.

Lehmann, Gerard; and Rassinoux, Therese, to Saft-Societe des Accumulateurs Fixes et de Traction. Electrochemical generator. 3,960,595, Cl. 136-6.0LN.

Leibee, Donald L.; Oaks, Seibert S.; and Evans, R. Douglas, Jr., to Kennametal Inc. Tool for cutting groove in hole. 3,960,222, Cl. 175-263.000.

Leimbacher, Erwin; Marte, Walter; and Buchele, Ferdinand, to Herberlein Textildruck AG. Process and apparatus for improving the fiber structure of textile material containing cellulose fibers. 3,960,484, Cl. 8-125.000.

Leistikow, Gerard K., to Mattel, Inc. Push toy adapted to pick up three-dimensional objects lying on a supporting surface. 3,959,922, Cl. 46-205.000.

Leitz, Ludwig; and Heitman, Knut, to Ernst Leitz G.m.b.H. System for achieving a maximum braking effect. 3,960,410, Cl. 303-21.00A.

Leland Stanford Junior University, The Board of Trustees of: *See*—
Carleton, Joseph G.; and Sweet, Richard G., 3,960,449.

Lelewski, Stanley, Jr.: *See*—
O'Brien, Robert J.; Lelewski, Stanley, Jr.; and LaFleur, Bob A., 3,960,738.

Leloux, Arnoldus Willem Jan, to Wavin B.V. Method of making a band of plastic bags. 3,960,062, Cl. 93-35.00R.

Lemercier, Jacques: *See*—
Dubot, Guy; and Lemercier, Jacques, 3,961,183.

Lennox Industries Inc.: *See*—
Vlasak, Robert, 3,959,984.

Lenton, R. Warren: *See*—
Russell, Donald H.; and Lenton, R. Warren, 3,960,813.

Leonard, Edward O., to Chemical Cleaning Composition Trust. Water-dispersable solvent emulsion type cleaner concentrate. 3,960,742, Cl. 252-90.000.

Leonard, Isaac E., III: *See*—
Abernathy, David D.; Adams, Herbert D.; Gilbertson, Warren L.; Leonard, Isaac E., III; and Silvia, Denis A., 3,960,085.

Leonard, Nelson J.: *See*—
Secrist, John A., III; Barrio, Jorge R.; Leonard, Nelson J.; and Weber, Gregorio, 3,960,840.

Leowald, Karl-Friedrich; and Schenk, Jakob, to Siemens Aktiengesellschaft. Firing circuit for an electric valve. 3,961,204, Cl. 307-252.00N.

Leprino Cheese Manufacturing Company: *See*—
Kielsmeier, Lester O., 3,961,077.

Lerch, Ulrich; and Granzer, Ernold, to Hoechst Aktiengesellschaft. Pharmaceutical composition containing 1-(imidazole-1-yl)-isoquinolines and method of treating hyperlipemia. 3,961,062, Cl. 424-258.000.

Lesher, George Y.; Gelotte, Karl O.; and Surrey, Alexander R., to Sterling Drug Inc. 4-[-(Alkoxy or polyhaloalkoxy)-benzamido]cyclohexanones. 3,960,945, Cl. 260-559.00R.

Leslie, William B.: *See*—
Dietzel, Russel W.; and Leslie, William B., 3,960,083.

Letchworth, Peter E.: *See*—
Baker, Don R.; Walker, Francis H.; and Letchworth, Peter E., 3,960,922.

Leunbach, Ib. Method and apparatus for the determination of electron density in a part volume of a body. 3,961,186, Cl. 250-272.000.

Leutwyler, Roy B., to Automated Building Components, Inc. Electrical component mounting panel. 3,960,353, Cl. 248-309.00R.

Levi Strauss & Co.: *See*—
Hakanson, Karin, 3,959,826.

Levin, Felix Lvovich; Golovanenko, Sergei Alexandrovich; Pridantsev, Mikhail Vasilievich; and Dmitriev, Vladimir Alexandrovich. Method of producing metal parts having magnetic and non-magnetic portions. 3,960,617, Cl. 148-121.000.

Levkovski, Nikola, to Lawrence Peska Associates, Inc., a part interest. Collapsible stool. 3,960,092, Cl. 108-41.000.

Lewis, Edward M. Table skirt mounting. 3,959,854, Cl. 24-84.00B.

Lewis, James L.: *See*—
Chen, Chang Chung; Holmes, Jack K.; and Lewis, James L., 3,961,282.

Lewis, Peter Sydney; and Lohning, Franklin Marius, to Tarax Pty. Limited. Sterilization apparatus. 3,961,150, Cl. 219-10.490.

Libbey-Owens-Ford Company: *See*—
Hamilton, Harold E.; and Oelke, Waldemar W., 3,960,535.

Liberi, Vincent Edward: *See*—
Jacobs, Emmett Smith; and Liberi, Vincent Edward, 3,960,528.

Licht, Helmut; and Kasper, Willi, to Fried. Krupp Huttenwerke AG. Lightweight railway wheel. 3,960,400, Cl. 295-11.000.

Lichtblau, George Jay. Real time signal discrimination circuitry. 3,961,322, Cl. 340-280.000.

Liconix: *See*—
Shull, William A., 3,960,422.

Liebman, Israel; and Corry, John, to United States of America, Interior. Passive explosion barrier. 3,960,217, Cl. 169-64.000.

Liepe, Friedrich; Langhans, Gerhard; Jagusch, Leonhard; Richter, Klaus; and Schlaf, Guenter, to VEB Chemieanlagenbau und Montagekombinat Leipzig. Installation for charging liquids, particularly fermentation liquids, with gas. 3,960,175, Cl. 137-604.000.

Liffick, Fenton A., to Cragar Industries, Inc. Dual size lug nut. 3,960,047, Cl. 85-32.00R.

Lind, Hanns: *See*—
Orban, Ivan; Lind, Hanns; Brunetti, Heimo; and Rody, Jean, 3,960,875.

Lindley, John; and McLeod, Andrew John, to Imperial Chemical Industries Limited. Separation process by fractional crystallization. 3,959,978, Cl. 62-58.000.

Lindtveit, Herbert E., to Sid Harvey, Inc. Reversible pump. 3,960,469, Cl. 418-39.000.

Linhart, Karl; and Schmitz, Reinold, to Bayer Aktiengesellschaft. Process for preparing 1-nitro-anthraquinone. 3,960,903, Cl. 260-369.000.

Linser, Jorg, to Artur Fischer. Valve assembly kit. 3,960,166, Cl. 137-271.000.

Lippert, Joseph, Jr., to Grumman Aerospace Corporation. Means to reduce and/or eliminate vortices, caused by wing body combinations. 3,960,345, Cl. 244-130.000.

Lippert, Thomas E.; and Skriba, Michael C., to United States of America, Environmental Protection Agency. System for dewatering dilute slurries. 3,960,732, Cl. 210-386.000.

Litova, Galina Nikolaevna: *See*—
Gortinskaya, Tatyana Vladimirovna; Mashkovsky, Mikhail Davidovich; Polezhaeva, Antonina Ivanovna; Nyrkova, Valentina Georgievna; Bondar, Larisa Nikolaevna; Litova, Galina Nikolaevna; Schukina, Maria Nikolaevna, deceased; and Preobrazhenskaya, Maria Nikolaevna, administrator, 3,961,058.

Litton Business Systems, Inc.: *See*—
Khanna, Rakesh, 3,961,208.

Litton Systems, Inc.: *See*—
Di Antonio, Daniel Joseph, 3,960,243.
Kirk, Donald C., Jr.; and Morin, Otto, 3,960,425.
McAdams, Hugh P., Jr., 3,961,212.

Lo, Allen Kwok Wah; and Nims, Jerry Curtis, to Dimensional Development Corporation. Methods and apparatus for taking and composing stereoscopic pictures. 3,960,563, Cl. 96-40.000.

Lockheed Aircraft Corporation: *See*—
Wirt, Leslie S.; and Morrow, Duane L., 3,960,004.

Loev, Bernard: *See*—
Bender, Paul E.; and Loev, Bernard, 3,961,069.

Lofton, John T.: *See*—
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Log Etronics Inc.: *See*—
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Loge, Olaf: *See*—
Ahrens, Hanns; Rufer, Clemens; Biere, Helmut; Schroder, Eberhard; Losert, Wolfgang; Loge, Olaf; and Schillinger, Ekkehard, 3,960,949.

Lohnert, Gunter; Muller-Frank, Ulrich; and Heil, Jurgen, to Interatom, Internationale Atomreaktrobau GmbH. Pebble-bed reactor. 3,960,656, Cl. 176-58.0PB.

Lohning, Franklin Marius: *See*—
Lewis, Peter Sydney; and Lohning, Franklin Marius, 3,961,150.

Loiudice, Mario: *See*—
Pavoni, Gustavo; Repossi, Enzo; and Loiudice, Mario, 3,961,311.

Lokkart, Hendricus Johannes, to International Telephone & Telegram Corporation. Velocity pick-off with noise cancellation. 3,961,214, Cl. 310-155.000.

Long, Alan Gibson; Walker, Derek; Eastlick, David Thomas; and Stables, Harry Carson, to Glaxo Laboratories Limited. Process for the preparation of esters of N-blocked penicillin acids which comprises reacting the acid or a salt thereof with a primary amine and a nitrosating agent. 3,960,843, Cl. 260-239.100.

Long, William R., Jr.: *See*—
Evans, James D.; and Long, William R., Jr., 3,960,616.

Longworth, Arthur Raymond: *See*—
Billany, Michael Royston; Longworth, Arthur Raymond; and Shatwell, John, 3,960,745.

Lonning, Thor J. G., to Monsanto Company. Polyvinyl chloride polyblend molding. 3,959,895, Cl. 36-32.00R.

Looger, Lonnie L., to United States of America, Army. Anti-tank rocket launcher telescoping tube locking device. 3,960,054, Cl. 89-1.816.

Lorimor, Larry W.: *See*—
Latimer, Eugene E.; and Lorimor, Larry W., 3,960,174.

Losert, Wolfgang: *See*—
Ahrens, Hanns; Rufer, Clemens; Biere, Helmut; Schroder, Eberhard; Losert, Wolfgang; Loge, Olaf; and Schillinger, Ekkehard, 3,960,949.

Louault, Gerard: *See*—
Louault, Guy; and Louault, Gerard, 3,959,959.

Louault, Guy; and Louault, Gerard, to S. A. Louault. Machine for vintaging grapes. 3,959,959, Cl. 56-330.000.

Lourdes Industries, Inc.: *See*—
Jakobsen, William J., 3,960,019.

Lovely, John D., to Electrohome Limited. Dynamic hue control networks. 3,961,362, Cl. 358-28.000.

Lovis, Brigitte, nee Ester, heir: *See*—
Ester, Wilhelm, deceased; Lovis, Brigitte, nee Ester, heir; Ester, Wolfgang, heir; and Heitmann, Wilhelm, 3,960,672.

Lowe, Robert R. Livestock identification tag. 3,959,908, Cl. 40-301.000.

Lubrizol Corporation, The: *See*—
Schroeck, Calvin William, 3,960,918.

Lucey, George K., Jr.: *See*—
Barnett, Charles W. H.; Lucey, George K., Jr.; and Augustine, Douglas R., 3,960,000.

Luck, Dieter G. Implement assembly for hydraulically operated excavators. 3,959,900, Cl. 37-117.500.

Ludovici, Werner: *See*—
Burger, Alex; Kaiser, Hermann; and Ludovici, Werner, 3,960,761.

Luense, John R.: *See*—
Johnson, Craig E.; and Luense, John R., 3,960,993.

Lukianoff, George V.; and Touw, Theodore R., to International Business Machines Corporation. Voltage contrast detector for a scanning electron beam instrument. 3,961,190, Cl. 250-310.000.

Lundwall, Robert J.: *See—*
Strader, Don S.; Masser, Lloyd G.; and Lundwall, Robert J., 3,960,388.

Lussow, Robert O.: *See—*
Berkenblit, Melvin; Lussow, Robert O.; and Reisman, Arnold, 3,961,114.

Luzzi, John J.: *See—*
Ramey, Chester R.; and Luzzi, John J., 3,960,809.

Lynch, Thomas E., Jr.: *See—*
Haining, Frank W.; Kolly, Joseph M.; and Lynch, Thomas E., Jr., 3,960,561.

Lyons, James E., to Sun Ventures, Inc. Conversion of formamides to isocyanates. 3,960,914, Cl. 260-453.00P.

Lysikov, Boris Vasilievich: *See—*
Alexeev, Viktor Ivanovich; Emelyanov, Ivan Yakovlevich; Ivanov, Vladimir Maximovich; Konstantinov, Leonard Vasilievich; Lysikov, Boris Vasilievich; Postnikov, Viktor Viktorovich; and Rybakov, Jury Viktorovich, 3,961,196.

Lyskov, Ivan Konstantinovich: *See—*
Filatov, Nikolai Grigorievich; Gridnev, Vitaly Nikiforovich; Gavriljuk, Valentin Gennadievich; Meshkov, Jury Yakovlevich; Mashlenko, Felix Isaakovich; Mikhailov, Konstantin Vasilievich; Fedorov, Valery Ionovich; Marchenko, Vladimir Zakharovich; Lyskov, Ivan Konstantinovich; and Budilovsky, Viktor Alexandrovich, 3,959,999.

Ma, Raymond, to Tel-Tone Corporation. Stop time-out until after first DTMF digit dialed circuit. 3,961,141, Cl. 179-16.0EC.

Maag Gear-Wheel & Machine Company Limited: *See—*
Sigg, Hans, 3,960,253.

Macaulay, David B.: *See—*
Gerstein, Bernard C.; and Macaulay, David B., 3,961,016.

MacGregor, John James, to Matthey Rustenburg Refiners, Limited. Process for the separation and purification of platinum, rhodium and iridium. 3,960,549, Cl. 75-108.000.

Machol, Guenther Keith: *See—*
Bowman, Robert A.; Machol, Guenther Keith; and Terlet, Rene Henri, 3,961,139.

Mack, Ronald H.: *See—*
Kobylarz, Lawrence P.; and Mack, Ronald H., 3,961,371.

Mack, Walter: *See—*
Hekimian, Norris C.; and Mack, Walter, 3,961,264.

MacKenzie, Burton Thornley, Jr., to General Electric Company. Method of stabilizing the dielectric strength of polyolefin polymers, and the stabilized compositions and products thereof. 3,960,739, Cl. 252-63.200.

MacKenzie, Morley Scott; Charron, Louis Donald; Dooley, Andrew Philip Charles; and Lee, John Davidson, to Nothern Electric Company Limited. Electrical connector. 3,960,431, Cl. 339-98.000.

Maddux, John F., to Owens-Corning Fiberglas Corporation. Apparatus and method for increasing electric power in an electric glass-melting furnace. 3,961,126, Cl. 13-6.000.

Maeda, Shiro: *See—*
Hosokawa, Hiroyuki; Maeda, Shiro; and Yamada, Kenji, 3,960,393.

Maestrone, Gian Paolo; and Mitrovic, Milan, to Hoffmann-La Roche Inc. Use of ipronidazole in combatting *Sphaerophorus necrophorus* infections. 3,961,068, Cl. 424-273.000.

Magnesium Elektron Limited: *See—*
Unsworth, William; and Fowler, Gordon Arthur, 3,960,609.

Magnus, Arthur Howard: *See—*
Cohen, Stuart Barry; Clark, James Monroe; and Magnus, Arthur Howard, 3,961,136.

Magnuson, Leo D. Bicycle pedal attachment. 3,960,027, Cl. 74-594.600.

Magosch, Karl Heinz; Feinauer, Roland; and Ruter, Jorn, to Chemische Werke Huls Aktiengesellschaft. Method for preparing low pilling effect polyester fiber products. 3,960,686, Cl. 204-159.190.

Magrisso, Israel B.: *See—*
Bodner, Ronald E.; Crooks, Thomas L.; Magrisso, Israel B.; Slack, Keith M.; and Smith, Richard S., 3,961,313.
Bodner, Ronald Eugene; Crooks, Thomas L.; Guest, John E.; Magrisso, Israel B.; and Slack, Keith K., 3,961,312.

Maida, Osamu, to Nippon Kogaku K.K. Remote control photographic apparatus. 3,961,342, Cl. 354-60.00R.

Maier, David P.: *See—*
Klanderman, Bruce H.; and Maier, David P., 3,960,752.

Maki, Naoki; and Suzuki, Katsunori, to Hitachi, Ltd. Linear synchronous motor powered vehicle. 3,960,090, Cl. 104-148.0LM.

Makley, James A.: *See—*
Hamisch, Paul H., Jr.; and Makley, James A., 3,960,642.

Malashenko, Alexander: *See—*
Futcher, Ralph James; and Malashenko, Alexander, 3,960,653.

Malen, Charles; and Laubie, Michel, to Science-Union et Cie. Thiochroman compounds. 3,960,891, Cl. 260-327.0TH.

Mallis, James N., to United States of America, Navy. Liquid vesicant differentiating paint. 3,960,759, Cl. 252-408.000.

Malmejac, Yves: *See—*
Faure, Jacqueline; Malmejac, Yves; and Schaub, Bernard, 3,960,647.

Maloney, Joseph V.; Geigel, Ronald J.; and Zidek, Peter R. Children's game. 3,960,379, Cl. 273-95.00R.

Manabe, Haruo: *See—*
Yasui, Hiroshi; Kyono, Iwao; Aoki, Hideo; and Manabe, Haruo, 3,961,031.

Manabe, Mikio: *See—*
Numata, Shunichi; Yokono, Hitoshi; Mukai, Junji; Muroi, Tadashi; Nakano, Mineo; and Manabe, Mikio, 3,960,982.

Manaugh, Carlisle F. Car parking structure with a car lift at the entrance thereof. 3,960,282, Cl. 214-16.1CB.

Mandon, Jean-Pierre: *See—*
Rabussier, Bernard; and Mandon, Jean-Pierre, 3,961,040.

Manning, Harold E., to Petro-Tex Chemical Corporation. Magnesium chromite dehydrogenation catalyst. 3,960,975, Cl. 252-465.000.

Manning, Harold E.: *See—*
Ellis, Michael C.; and Manning, Harold E., 3,960,776.

Manning, Steven J.: *See—*
Townsend, Leroy B.; Earl, Robert A.; and Manning, Steven J., 3,960,864.

Manta: *See—*
Bogaert, Pieter Joseph, 3,960,089.

Manzonelli, Carmen C.; and Blossey, Robert G., to National Steel Corporation. Novel aluminum alloy, continuously cast aluminum alloy shapes, method of preparing semirigid container stock therefrom, and container stock thus prepared. 3,960,607, Cl. 148-2.000.

Marach, David R.: *See—*
Bailey, William R.; Krumm, Stephen H.; and Marach, David R., 3,960,435.

Marathon Oil Company: *See—*
Allred, Victor D., 3,960,702.

Marchbanks, Clandes B. Ventilated screen for motor vehicle passenger compartment window openings. 3,960,195, Cl. 160-105.000.

Marchenko, Vladimir Zakharovich: *See—*
Filatov, Nikolai Grigorievich; Gridnev, Vitaly Nikiforovich; Gavriljuk, Valentin Gennadievich; Meshkov, Jury Yakovlevich; Mashlenko, Felix Isaakovich; Mikhailov, Konstantin Vasilievich; Fedorov, Valery Ionovich; Marchenko, Vladimir Zakharovich; Lyskov, Ivan Konstantinovich; and Budilovsky, Viktor Alexandrovich, 3,959,999.

Marchetti, Joseph R.: *See—*
Dowbenko, Rostyslaw; and Marchetti, Joseph R., 3,960,795.

Marco, Leslie Stephan, to Illinois Tool Works Inc. Thermoplastic preform and heated mandrel constructions. 3,961,113, Cl. 428-35.000.

Maremont Corporation: *See—*
Conley, James F., 3,960,053.

Markowtiz, Hal: *See—*
Fial, Ronald Augustine; and Markowtiz, Hal, 3,960,254.

Marks, Alvin M. Electrostatic air purifier using charged droplets. 3,960,505, Cl. 23-284.000.

Marquardt, Robert J., to Miller Industries, Inc. Roller assembly for sliding doors. 3,959,849, Cl. 16-105.000.

Marques, Jerry G.: *See—*
McClure, Randall D.; and Marques, Jerry G., 3,960,238.

Marrian, Stanley Frederic: *See—*
Gasson, Edward James; Krosnar, Thomas Charles; and Marrian, Stanley Frederic, 3,960,925.

Marte, Walter: *See—*
Leimbacher, Erwin; Marte, Walter; and Buchele, Ferdinand, 3,960,484.

Martin Engineering Co.: *See—*
Bickers, Fredrick Allen, 3,960,173.

Martin, Eugene Ray, to SWS Silicones Corporation. Detergent resistant polish compositions. 3,960,575, Cl. 106-10.000.

Martin Marietta Corporation: *See—*
Casadevall, James L., 3,960,626.

Martin, Robertson & Bain Ltd.: *See—*
Cox, James Patrick; and Cox, Jeanne Marie, 3,961,084.

Martin, Rolf, to BHS-Bayerische Berg Hutten-und Salzwerke Aktiengesellschaft. Rotor alignment apparatus for a processing and power generating machine. 3,960,028, Cl. 74-405.000.

Martins, Joseph G.: *See—*
Fantl, Joel; and Martins, Joseph G., 3,960,485.

Maruyama, Isamu; Yamamoto, Hisao; Nakao, Masaru; Sakai, Shigeru; Sasajima, Kikuo; Kitagawa, Sumio; and Inaba, Shigeho, to Sumitomo Chemical Co., Ltd. 1-Phenylthiopropyl-4-hydroxy-4-phenyl piperidines. 3,960,873, Cl. 260-293.730.

Maryland Cup Corporation: *See—*
Hollinger, Paul, 3,960,299.

Maschinenfabrik Augsburg-Nurnberg AG: *See—*
Schurrer, Josef, 3,961,184.
Seidel, Karlheinz, 3,959,887.

Maschinenfabrik Ernst Thielenhaus: *See—*
Golitz, Friederich, 3,959,990.

Maschinenfabrik Zuckermann Komm. Ges. Wien: *See—*
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Masepohl, John C.: *See—*
Gear, Robert B., Jr.; and Masepohl, John C., 3,961,127.

Mashkovsky, Mikhail Davidovich: *See—*
Gortinskaya, Tatyana Vladimirovna; Mashkovsky, Mikhail Davidovich; Polezhaeva, Antonina Ivanovna; Nyrkova, Valentina Georgievna; Bondar, Larisa Nikolaevna; Litova, Galina Nikolaevna; Schukina, Maria Nikolaevna, deceased; and Preobrazhenskaya, Maria Nikolaevna, administrator, 3,961,058.

Mashlenko, Felix Isaakovich: *See—*
Filatov, Nikolai Grigorievich; Gridnev, Vitaly Nikiforovich; Gavriljuk, Valentin Gennadievich; Meshkov, Jury Yakovlevich; Mashlenko, Felix Isaakovich; Mikhailov, Konstantin Vasilievich; Fedorov, Valery Ionovich; Marchenko, Vladimir Zakharovich;

Lyskov, Ivan Konstantinovich; and Budilovsky, Viktor Alexandrovich, 3,959,999.
Masonite Corporation: *See—*
Bradley, Steven Y., 3,959,839.
Masser, Lloyd G.: *See—*
Strader, Don S.; Masser, Lloyd G.; and Lundwall, Robert J., 3,960,388.
Massie, Stephen N., to Universal Oil Products Company. Method of producing reinforced foamed structures. 3,960,999, Cl. 264-45.300.
Masuda, Takao: *See—*
Ikenoue, Shinpei; and Masuda, Takao, 3,960,566.
Ikenoue, Shinpei; and Masuda, Takao, 3,960,908.
Mathe, Istvan, to Bunker Ramo Corporation. Tool and adapter for electrical connector unit using insulation piercing contacts. 3,959,868, Cl. 29-203.0DT.
Matsuda, Atsushi: *See—*
Kono, Osamu; Tsuchiya, Noboru; Matsuda, Atsushi; and Yoshida, Kiichi, 3,961,202.
Matsuda, Tetsuo; Yamaguchi, Tsutomu; Fujii, Tadashiro; Matsumoto, Kunio; Morishita, Masataka; Fukushima, Mitsuru; and Shibuya, Yuzo, to Toyo Jozo Kabushiki Kaisha. Process for the production of 7-amino-cephem compounds. 3,960,662, Cl. 195-29.000.
Matsuda, Tetsuo: *See—*
Morishita, Masataka; Inaba, Yoshihito; Fukushima, Mitsuru; Hattori, Yoshinori; Kobari, Sadami; and Matsuda, Tetsuo, 3,960,757.
Matsuda, Toshiharu: *See—*
Morita, Tomijiro; Kobayashi, Akio; Funahashi, Isao; Matsuda, Toshiharu; Naoki, Makoto; Kawamata, Naoyuki; and Fukui, Jun, 3,961,021.
Matsui, Komaharu: *See—*
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Matsumoto, Kunio: *See—*
Matsuda, Tetsuo; Yamaguchi, Tsutomu; Fujii, Tadashiro; Matsumoto, Kunio; Morishita, Masataka; Fukushima, Mitsuru; and Shibuya, Yuzo, 3,960,662.
Matsumoto, Seiichi: *See—*
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Matsumura, Kazuhiro: *See—*
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Minakuchi, Hiroshi, 3,961,207.
Moriyama, Akio; Fukai, Masakazu; and Asai, Komei, 3,960,750.
Moriyama, Akio; Fukai, Masakazu; Tatsuta, Hiroshi; and Takahashi, Hiroaki, 3,960,751.
Nagata, Takashi; and Mindlin, Raymond David, 3,961,210.
Ohigashi, Tugio; and Ariga, Junichi, 3,961,265.
Okuno, Noboru; Kamogawa, Toshiro; and Kamisaka, Kosei, 3,961,359.
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Tsujikawa, Masahiro; Ozasa, Minoru; Takagi, Fumio; Hirai, Katsumi; Iwasaki, Akio; Imamura, Hiroshi; and Ueda, Testuhiro, 3,960,507.
Matsushita Electronics Corporation: *See—*
Kuwagata, Masahiro; Yamada, Masao; Nakamura, Kenichiro; and Kawakami, Yorisada, 3,961,354.
Matsuura, Hiroshi; Ishimoto, Kazuo; and Yasukuni, Takashi, to Mitsubishi Jukogyo Kabushiki Kaisha. Reduced pressure mould production method. 3,960,198, Cl. 164-7.000.
Mattel, Inc.: *See—*
Leistikow, Gerard K., 3,959,922.
Matthey Rustenburg Refiners, Limited: *See—*
MacGregor, John James, 3,960,549.
Matton, George. Shoe-stiffener material of latex saturated flexible fabric. 3,961,124, Cl. 428-250.000.
Mattox, William J.: *See—*
Hamner, Glen P.; and Mattox, William J., 3,961,036.
Mattson, Richard W., to Eltra Corporation. Dual vacuum actuator ignition timing. 3,960,125, Cl. 123-117.00A.
Mauser Kommanditgesellschaft: *See—*
Kader, Reiner, 3,960,474.
Mauz, Otto, to Hoechst Aktiengesellschaft. Process for the manufacture of condensation products from phenols and polyacetoacetic acid esters. 3,960,928, Cl. 260-473.00S.
Mauz, Otto, to Hoechst Aktiengesellschaft. Process for manufacture of condensation products from phenols and acetoacetic acid esters. 3,960,929, Cl. 260-473.00S.
Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V.: *See—*
Eibl, Hansjorg; and Nicksch, Alfar, 3,960,905.
May, Bob. Cigarette case. 3,960,270, Cl. 206-256.000.
May, William P. Combination vibrating cutter head and crusher. 3,959,897, Cl. 37-58.000.
Mayer, Rolf; and Menzel, Walter, to Bosch-Siemens Hausgerate GmbH. Refuse compactor. 3,960,071, Cl. 100-229.00A.
Mayers, Bernard J.: *See—*
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Mayr, Hubert; Presoly, Elfriede; Weinrotter, Ferdinand; Muller, Walter; Stern, Gerhard; and Frohner, Walter Mizzi, deceased (by Frohner, Maria), to Chemie Linz Aktiengesellschaft. Process for regulating or influencing the growth and metabolism of plants. 3,960,541, Cl. 71-88.000.
Mazzoni, Albert H., Jr. Ski carrying strap. 3,960,302, Cl. 224-45.00S.
McAdams, Hugh P., Jr., to Litton Systems, Inc. Integral servomechanism. 3,961,212, Cl. 310-68.00R.
McCabe, Charles W.: *See—*
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McCabe, Francis J. Air control apparatus. 3,960,065, Cl. 98-40.00D.
McCloskey, Albert R., to Heim Universal Corporation. Spherical bearing having adjustable key. 3,960,416, Cl. 308-72.000.
McCloskey, Edward W. Expandable irrigation signal. 3,960,107, Cl. 116-118.00A.
McClure, David L.; and Tweedie, Jeffrey D. Object compacting device. 3,960,070, Cl. 100-49.000.
McClure, Randall D.; and Marques, Jerry G., to Caterpillar Tractor Co. Sound attenuating engine enclosure. 3,960,238, Cl. 181-33.00K.
McCollum, John D.; and Quick, Leonard M., to Standard Oil Company. Process for upgrading a hydrocarbon fraction. 3,960,706, Cl. 208-112.000.
McCollum, John D.; and Quick, Leonard M., to Standard Oil Company. Process for upgrading a hydrocarbon fraction. 3,960,708, Cl. 208-121.000.
McCormick, John B., to Lawrence Peska Associates, Inc., a part interest. Garden tractor. 3,960,231, Cl. 180-19.00R.
McCoy, Thomas E.: *See—*
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McCulloch Corporation: *See—*
Anderson, Harold E.; and Kiner, Gerald T., 3,960,128.
McDonnell Douglas Corporation: *See—*
Holmes, Richard N., 3,960,236.
Mc Elwain, James A., to Houdaille Industries, Inc. Punch press. 3,960,372, Cl. 269-320.000.
McFadden, Eldon C. Pipe lining apparatus. 3,960,644, Cl. 156-390.000.
McGraw-Edison Company: *See—*
Irelan, Edward A.; Dorheim, David W.; and Robotham, William Frederick, 3,959,878.
McKenzie, Carl O. Molasses feed block for animals and method of making same. 3,961,081, Cl. 426-658.000.
McKenzie, Ian, to Clark Equipment Company. Compact tree clamp. 3,960,371, Cl. 269-55.000.
McLeod, Andrew John: *See—*
Lindley, John; and McLeod, Andrew John, 3,959,978.
McMillen, Clarence: *See—*
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McMinn, Robert E.: *See—*
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McMorris, Arthur H.: *See—*
Ahlgren, Erick L.; McMorris, Arthur H.; Miille, Jerry L.; and Schweppe, Joseph L., 3,960,072.
McNamee, Anthony. Flexible coupling. 3,959,988, Cl. 64-15.00B.
McNaney, Joseph T. Light optic data handling system. 3,960,440, Cl. 350-161.000.
McNeely, William H.: *See—*
Kang, Kenneth Suk; and McNeely, William H., 3,960,832.
McTaggart, Larry S., to Minnesota Mining and Manufacturing Company. Thermoformed polyester articles having impact resistance and high temperature dimensional stability. 3,960,807, Cl. 260-40.00R.
McWatters, William Andrew. Dredge ladder shock mounting arrangement. 3,959,898, Cl. 37-72.000.
Medendorp, Roger L., to Kirkhof Manufacturing Corporation. Container molding apparatus. 3,960,471, Cl. 425-388.000.
Medical Development Corporation: *See—*
Holbrook, Legrand K.; and Sturdevant, Gary F., 3,960,165.
Mehta, Manankumar S.: *See—*
Bakke, Even; Witte, Michael; and Mehta, Manankumar S., 3,960,687.
Meienhofer, Johannes Arnold, to United States of America, Health, Education and Welfare. Catalytic hydrogenolysis of protected sulfur containing peptides. 3,960,828, Cl. 260-112.50R.
Meinert, Norbert: *See—*
Broemer, Heinz; Meinert, Norbert; and Spincic, Johann, 3,960,579.
Mekari, Milad H. Cooling system. 3,959,971, Cl. 60-517.000.
Melnick, Igor: *See—*
Lazzari, Jean-Pierre; and Melnick, Igor, 3,961,299.
Menke, John R.: *See—*
Boorse, Henry A.; Boeker, Gilbert F.; and Menke, John R., 3,960,468.
Mennen, Frederick C.: *See—*
Smith, David M.; and Mennen, Frederick C., 3,959,955.
Menzel, Walter: *See—*
Mayer, Rolf; and Menzel, Walter, 3,960,071.
Mercier, Jacques H. Pressure vessel. 3,960,178, Cl. 138-30.000.
Merck & Co., Inc.: *See—*
Engelhardt, Edward L.; and Remy, David C., 3,960,974.
Novello, Frederick C., 3,960,854.
Prugh, John D., 3,960,872.
Merianos, John J.; and Adams, Phillip, to Millmaster Onyx Corporation. Amino derivatives of tetrasubstituted benzene compounds. 3,960,538, Cl. 71-67.000.

Merianos, John J.: *See—*
Green, Harold A.; Merianos, John J.; and Petrocci, Alfonso N., 3,961,042.

Merson, Karol J. W., to Wonder Steel Manufacturing International (Ontario) Limited. Combined spacer and transverse reinforcing beam. 3,959,942, Cl. 52-551.000.

Meshkov, Jury Yakovlevich: *See—*
Filatov, Nikolai Grigorievich; Gridnev, Vitaly Nikiforovich; Gavriljuk, Valentin Gennadievich; Meshkov, Jury Yakovlevich; Mashlenko, Felix Isaakovich; Mikhailov, Konstantin Vasilievich; Fedorov, Valery Ionovich; Marchenko, Vladimir Zakharovich; Lyskov, Ivan Konstantinovich; and Budilovsky, Viktor Alexandrovich, 3,959,999.

Mesur-Matic Electronics Corporation: *See—*
Newell, Harold R., 3,961,232.

Metallgesellschaft Aktiengesellschaft: *See—*
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Schmalfeld, Paul; Sauter, Dieter; and Cappel, Fred Erich, 3,960,543.

Metcalf, Brian Walter; and Jung, Michel, to Richardson-Merrell Inc. Olefinic derivatives of amino acids. 3,960,927, Cl. 260-471.00A.

Meyer, Alfred: *See—*
Kroebel, Reinhard; and Meyer, Alfred, 3,960,762.

Meyer, Paul, to Lawrence Peska Associates, Inc., a part interest. Whistling scaling toy. 3,959,916, Cl. 46-74.00D.

Meyer, Roth & Pastor Maschinenfabrik GmbH: *See—*
Wust, Toni, 3,959,965.

Meylan, Pierre, to BBC Brown Boveri & Company Limited. Apparatus for controlling steam blocking at stuffing boxes for steam turbine shafting. 3,959,973, Cl. 60-657.000.

Michaelis, David E., to Plastics Development Corporation of America. Simulated wood panel. 3,961,118, Cl. 428-151.000.

Michaels, Thomas B.: *See—*
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Michel, Max: *See—*
Fort, Jean-Paul; and Michel, Max, 3,960,772.

Mickley, Harold S., to Stauffer Chemical Company. Process for preparing hydrogen sulfide. 3,961,035, Cl. 423-563.000.

Microlife Technics, Inc.: *See—*
Olsen, Ronald H.; and Rothchild, Harold, 3,960,664.

Microseal Corporation: *See—*
Anderson, Thomas P., 3,959,907.

Middlemark, Marvin P. Elongated television receiving antenna for indoor use. 3,961,332, Cl. 343-802.000.

Mihic, Wlajko. Clamping arrangement for a cutting tool. 3,959,861, Cl. 29-96.000.

Miille, Jerry L.: *See—*
Ahlgren, Erick L.; McMorris, Arthur H.; Miille, Jerry L.; and Schweppe, Joseph L., 3,960,072.

Mika, Paul L.; Rothlisberger, Kurt; and Vee, Richard F., to Teletype Corporation. Apparatus for cleaning an informational tape. 3,961,375, Cl. 360-137.000.

Mika, Paul L.: *See—*
Herbst, Wayne R.; and Mika, Paul L., 3,961,368.

Mikhailov, Konstantin Vasilievich: *See—*
Filatov, Nikolai Grigorievich; Gridnev, Vitaly Nikiforovich; Gavriljuk, Valentin Gennadievich; Meshkov, Jury Yakovlevich; Mashlenko, Felix Isaakovich; Mikhailov, Konstantin Vasilievich; Fedorov, Valery Ionovich; Marchenko, Vladimir Zakharovich; Lyskov, Ivan Konstantinovich; and Budilovsky, Viktor Alexandrovich, 3,959,999.

Miklas, Edward J.: *See—*
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Miles Laboratories, Inc.: *See—*
White, Fred K., 3,960,499.
White, Fred K., 3,961,346.

Milkovic, Miran, to General Electric Company. Single phase 3-wire electronic electrical energy meter. 3,961,257, Cl. 324-142.000.

Miller, David J.: *See—*
Wiewiorowski, Tadeusz K.; and Miller, David J., 3,961,030.

Miller, Edward F.: *See—*
Cullen, William P.; Chafetz, Harry; and Miller, Edward F., 3,960,889.

Miller, Frederick W., III, to Extracorporeal Medical Specialties Inc. Embossed support for dialyzer membrane. 3,960,730, Cl. 210-321.00A.

Miller Industries, Inc.: *See—*
Marquardt, Robert J., 3,959,849.

Miller, Robert C.; and Hackett, Barrie H., to Safeway Products Inc. Electrical radiant heater panel. 3,961,157, Cl. 219-345.000.

Miller, Thomas J. Boat transport anchoring means. 3,960,301, Cl. 224-42.10R.

Millmaster Onyx Corporation: *See—*
Green, Harold A.; Merianos, John J.; and Petrocci, Alfonso N., 3,961,042.
Merianos, John J.; and Adams, Phillip, 3,960,538.

Mills, Jeffrey P., to GTE Automatic Electric Laboratories Incorporated. PCM tone receiver using optimum statistical technique. 3,961,167, Cl. 235-152.000.

Minakuchi, Hiroshi, to Matsushita Electric Industrial Co., Ltd. Output retaining electronic circuit. 3,961,207, Cl. 307-273.000.

Minchom Magnetic Systems Limited: *See—*
Minchom, Raphael Isaac, 3,961,244.

Minchom, Raphael Isaac, to Minchom Magnetic Systems Limited. Magnetizing means for a magnetic flaw detector including a charging and discharging circuit. 3,961,244, Cl. 324-38.000.

Mindlin, Raymond David: *See—*
Nagata, Takashi; and Mindlin, Raymond David, 3,961,210.

Mine Safety Appliances Company: *See—*
Hough, William Vernon; Guibert, Clarence Robert; and Hefferan, Gerald Thomas, 3,961,017.

Minks, Werner; and Zebisch, Manfred W., to International Standard Electric Corporation. Electrical connector. 3,960,436, Cl. 339-221.00M.

Minnesota Mining and Manufacturing Company: *See—*
Close, James R.; Wood, William P.; Hatch, Robert A.; and Johnson, James R., 3,959,865.
Fisch, Richard S.; and Newman, Norman, 3,960,565.
Hansen, Robert L., 3,960,950.
Knapp, Philip B., 3,960,292.
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Mino, Junryo: *See—*
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Minolta Camera Kabushiki Kaisha: *See—*
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Ogawa, Masaya; Wada, Kenichi; and Yasue, Yoshihiko, 3,960,446.
Sahara, Masayoshi, 3,961,338.
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Minuto, Maurice A. Method of making silicone polymer with fillers dispersed therein and using same to make silicone rubber. 3,960,804, Cl. 260-37.0SB.

Mironov, Nikolai Petrovich: *See—*
Baranova, Rimma Bronislavovna; Lazarev, Vladimir Ilich; Mironov, Nikolai Petrovich; Pinaev, Viktor Alexandrovich; Bugaenko, Lenar Timofeevich; Kalyazin, Evgeny Petrovich; Panferova, Alexandra Timofeevna; Byakov, Vsevolod Mikhailovich; Nikeshichev, Jury Nikolaevich; and Petryaev, Petrovich Evgeny, 3,960,682.

Miskel, John J., Jr.: *See—*
Kelley, Joseph M.; and Miskel, John J., Jr., 3,960,987.

Mitchell, Neal L., to Chevron Research Company. Method and apparatus for performing sequentially timed operations in a well. 3,960,215, Cl. 166-315.000.

Mitchell, Neal L.: *See—*
Hutchison, Stanley O.; and Mitchell, Neal L., 3,960,211.

Mitoff, Stephan P.; Powers, Robert W.; and Breiter, Manfred W., to General Electric Company. Battery casing and hermetically sealed sodium-sulfur battery. 3,960,596, Cl. 136-6.0FS.

Mitrovic, Milan: *See—*
Maestrone, Gian Paolo; and Mitrovic, Milan, 3,961,068.

Mitsubishi Chemical Industries Ltd.: *See—*
Suzuki, Yoshiaki; Mori, Hajime; and Nakanome, Takemi, 3,960,976.

Mitsubishi Jukogyo Kabushiki Kaisha: *See—*
Matsuura, Hiroshi; Ishimoto, Kazuo; and Yasukuni, Takashi, 3,960,198.

Mitsubishi Mining & Cement Company, Ltd.: *See—*
Tachibana, Kan-ichi; Nishioka, Michihiro; Uchida, Akio; and Ono, Mikiya, 3,961,225.

Mitsui Mining & Smelting Co., Ltd.: *See—*
Nomura, Etsuji; Aramaki, Masaharu; and Nishimura, Yuji, 3,960,681.

Mitsui Shipbuilding & Engineering Co., Ltd.: *See—*
Suzuki, Hideo, 3,960,101.

Mitsui Toatsu Chemicals, Incorporated: *See—*
Tsujimoto, Michihiro; Nishizawa, Tsutomu; and Okubo, Ichiro, 3,960,479.

Mix, Konrad: *See—*
Heinrich, Ernst; Mix, Konrad; and Ribka, Joachim, 3,960,480.

Miyahara, Kingo, to Dowa Co., Ltd. Handle for opening and closing a door. 3,960,396, Cl. 292-347.000.

Miyamoto, Masaki: *See—*
Isukamoto, Hiroji; Morikawa, Hisashi; Nakagawa, Masao; Kato, Shinji; Miyamoto, Masaki; Yoda, Toichiro; and Yoshihara, Katsuhiko, 3,960,787.

Miyazaki, Kensaku, to Olympus Optical Co., Ltd. Light path switching indicator for optical instruments. 3,961,348, Cl. 354-289.000.

Miyazaki, Nobuto: *See—*
Chino, Shigeru; Miyazaki, Nobuto; and Takahashi, Tadaya, 3,960,176.

Miyosawa, Yoshiaki; and Umemoto, Sueo, to Kansai Paint Company, Ltd. Coating process for aluminum and aluminum alloy. 3,960,676, Cl. 204-38.00A.

Mizote, Hiroyuki: *See—*
Fukumaru, Toshitsugu; Kobayashi, Kenji; Mizote, Hiroyuki; Inaba, Shigeho; and Yamamoto, Hisao, 3,961,066.

Mizukoshi, Kaoru: *See—*
Sato, Kuniaki; Toyama, Kozo; Saheki, Toshio; Mizukoshi, Kaoru; and Suzuki, Shuei, 3,960,458.

Moan, Kenneth L.; and Pei, Yu Kun, to Owens-Illinois, Inc. Solar energy collection system. 3,960,136, Cl. 126-271.000.

Mobil Oil Corporation: *See—*
Allen, Paul T., 3,960,520.
Garwood, William E.; and Wise, John J., 3,960,705.
Givens, Edwin N.; Plank, Charles J.; and Rosinski, Edward J., 3,960,978.
Gross, Benjamin; Jacob, Solomon M.; Nace, Donald M.; and Voltz, Sterling E., 3,960,707.
Huvar, Arthur J., 3,961,043.
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Mochizuki, Hiroshi: *See—*
Yoda, Naoya; Yoshi-i, Toshiya; Fujita, Saburo; Mochizuki, Hiroshi; Yumoto, Hirosuke; Kurihara, Masaru; Kubota, Takashi; Dokoshi, Noriaki; and Tanaka, Chiaki, 3,961,009.

Modine Manufacturing Company: *See—*
Frost, Donald J., 3,959,867.

Moffitt, Myron L., to Mobil Oil Corporation. Method and apparatus for the production of shear seals in thermoplastic materials. 3,960,636, Cl. 156-290.000.

Mohndruck Reinhard Mohn OHG: *See—*
Gustavs, Helmut; and Dudziak, Ernst, 3,960,081.

Molenaar, Arian; and Jonker, Hendrik, to U.S. Philips Corporation. Physical development process utilizing a physical developer containing a specific reducing agent, a thiol compound. 3,960,564, Cl. 96-48.0PD.

Moller, Paul S., to Discojet Corporation. Torque converter. 3,960,036, Cl. 74-802.000.

Monarch Marking Systems, Inc.: *See—*
Hamisch, Paul H., Jr.; and Makley, James A., 3,960,642.

Monroe Belgium N.V.: *See—*
Keijzer, Johan H.; Pierle, Willy R. J.; and Van de Voorde, G., 3,960,385.

Monsanto Company: *See—*
Campbell, Charles R.; Danly, Donald E.; and Mueller, Werner H., 3,960,679.
Fantl, Joel; and Martins, Joseph G., 3,960,485.
Lonning, Thor J. G., 3,959,895.

Montanari, Roberto. Chemical compounds for trichomoniasis and candidiosis treatment. 3,960,882, Cl. 424-273.000.

Montedison S.p.A.: *See—*
Ribaldone, Giuseppe; Borsotti, Giampiero; and Gonzati, Franco, 3,960,866.

Montgomery, Theodore, to Wise, Wayne T., a part interest. Fishing signal device. 3,959,910, Cl. 43-17.000.

Moore, Samuel D., to Texas Instruments Incorporated. Programmable phase coded surface wave device. 3,961,290, Cl. 333-30.00R.

Moran, James: *See—*
Conway, Bernard W.; and Moran, James, 3,960,652.

Morawetz, Gottfried; and Buxbaum, Lothar, to Ciba-Geigy AG. Solid phase polyester polycondensation. 3,960,817, Cl. 260-75.00M.

Moreau, Wayne M.: *See—*
Gipstein, Edward; Moreau, Wayne M.; and Need, Omar U., III, 3,961,099.

Morehead, Charles D.: *See—*
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Morehouse, Industries, Inc.: *See—*
Szkaradek, Edward J., 3,960,331.

Morelli, Morello: *See—*
Piccinini, Carlo; Morelli, Morello; and Rebora, Pierluigi, 3,960,775.

Morgan, David Frederick, to Eaton Corporation. Controller for fluid pressure operated devices providing high pressure to an auxiliary device. 3,960,234, Cl. 180-132.000.

Mori, Hajime: *See—*
Suzuki, Yoshiaki; Mori, Hajime; and Nakanome, Takemi, 3,960,976.

Mori, Mitsuo; and Ohashi, Kengo, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Apparatus for driving detaching rollers in textile combing machines. 3,960,024, Cl. 74-52.000.

Morikawa, Hisashi: *See—*
Isukamoto, Hiroji; Morikawa, Hisashi; Nakagawa, Masao; Kato, Shinji; Miyamoto, Masaki; Yoda, Toichiro; and Yoshihara, Katsuhiko, 3,960,787.

Morin, Otto: *See—*
Kirk, Donald C., Jr.; and Morin, Otto, 3,960,425.

Morioka, Makoto: *See—*
Kawamura, Masao; Ito, Kazuhiro; Morioka, Makoto; Ono, Yuichi; Ishioka, Sachio; and Kurata, Kazuhiro, 3,960,618.

Morioka, Yuji; and Dejima, Shigeo, to Sanyo Electric Co., Ltd. Alkaline battery. 3,960,603, Cl. 136-135.00R.

Morisaki, Nobukazu, to Daido Metal Company, Ltd. Pulse time interval measuring system. 3,961,258, Cl. 324-189.000.

Morishita, Masataka; Inaba, Yoshihito; Fukushima, Mitsuru; Hattori, Yoshinori; Kobari, Sadami; and Matsuda, Tetsuo, to Toyo Jozo Co., Ltd. Process for encapsulation of medicaments. 3,960,757, Cl. 252-316.000.

Morishita, Masataka: *See—*
Matsuda, Tetsuo; Yamaguchi, Tsutomu; Fujii, Tadashiro; Matsumoto, Kunio; Morishita, Masataka; Fukushima, Mitsuru; and Shibuya, Yuzo, 3,960,662.

Morita, Tomijiro; Kobayashi, Akio; Funahashi, Isao; Matsuda, Toshiharu; Naoki, Makoto; Kawamata, Naoyuki; and Fukui, Jun, to Kureha Kagaku Kogyo Kabushiki Kaisha. Method for removing sulfur dioxide from combustion exhaust gas. 3,961,021, Cl. 423-242.000.

Moriyama, Akio; Fukai, Masakazu; and Asai, Komei, to Matsushita Electric Industrial Co., Ltd. Electro-optical display. 3,960,750, Cl. 252-299.000.

Moriyama, Akio; Fukai, Masakazu; Tatsuta, Hiroshi; and Takahashi, Hiroaki, to Matsushita Electric Industrial Co., Ltd. Electro-optical display element. 3,960,751, Cl. 252-299.000.

Morley Studios: *See—*
High, Cliff R.; and Brotman, Morley, 3,960,257.

Morozov, Boris Sergeevich: *See—*
Fridlyander, Iosif Naumovich; Yatsenko, Konstantin Petrovich; Nekrasova, Galina Anatolievna; Gulin, Alexandr Nikolaevich; Semenova, Zoya Grigorievna; Sidorov, Nikolai Grigorievich; Morozov, Boris Sergeevich; Krichevsky, Efrem Julievich; Zakharova, Tatyana Alexandrovna; and Sarycheva, Raisa Grigorievna, 3,960,551.

Morris, Arthur: *See—*
Jones, Eileen; Morris, Arthur; Thomas, Ieuan; and Traynor, James Rodney, 3,960,819.

Morrison, Stanley Roy; and Freund, Thomas, to Stanford Research Institute. Stabilized pigment and method for producing the same. 3,960,589, Cl. 106-296.000.

Morrow, Duane L.: *See—*
Wirt, Leslie S.; and Morrow, Duane L., 3,960,004.

Morrow, James B.: *See—*
Dicks, Mason L.; and Morrow, James B., 3,960,715.

Morrow, James J.; and Dailey, Leo L., to Fischer & Porter Co. Technique for continuously analyzing the concentration of ozone dissolved in water. 3,960,673, Cl. 204-1.00R.

Mort, Paul R., Jr.; and Cleary, Robert A., to Syncro-Motion Corporation. Bottom labeling apparatus. 3,960,640, Cl. 156-351.000.

Mosimann, Hans; Heim, Peter; and Borer, Charles, to Schweizerische Isola-Werke. Heat-resistant adhesive lacquers as wire coatings. 3,960,799, Cl. 260-30.200.

Moss, Royston Arthur Leslie. Omnidirectional ultrasonic intrusion surveillance unit. 3,961,321, Cl. 340-258.00B.

Motorola, Inc.: *See—*
Briggs, Glenn E.; Beach, Edmund E.; and Chase, Walter P., 3,961,228.
Wiggenhorn, James T., 3,961,296.

Motter, John C., to Motter Printing Press Co. Method for deplating and replating rotogravure cylinders. 3,960,675, Cl. 204-25.000.

Motter Printing Press Co.: *See—*
Motter, John C., 3,960,675.

Moulin, Norbert L., to Hughes Aircraft Company. Connector assembly with axially operable engagement means. 3,960,429, Cl. 339-91.00R.

Muanyagipari Kutato Intezet: *See—*
Pataki, Zsuzsa, nee Nagy; Windisch, Ferenc; Nagy, Jozsef; Kecskemethy, Geza; and Virag, Gyorgy, 3,960,630.

Mudrak, Anton: *See—*
Hildering, Roelof; and Mudrak, Anton, 3,960,677.

Mueller, Karl Heinz; and Hubert, Hans-Juergen, to Schering Aktiengesellschaft. Process for the preparation of trialkyl aluminum compounds. 3,960,912, Cl. 260-448.00A.

Mueller, Werner H.: *See—*
Campbell, Charles R.; Danly, Donald E.; and Mueller, Werner H., 3,960,679.

Mugino, Yutaka: *See—*
Tomikawa, Masami; Tsunoda, Akiji; Kaneda, Kazuhisa; Ohkawa, Hideo; and Mugino, Yutaka, 3,960,722.

Muhlfeld, Hans P.: *See—*
Hurley, William J.; and Muhlfeld, Hans P., 3,961,251.

Muhlner, Karl: *See—*
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Muir, David Michael: *See—*
Parker, Alan James; Waghorne, Winfield Earle; Giles, Dion Ewing; Sharp, John Howard; Alexander, Robert; and Muir, David Michael, 3,961,028.

Muir, Thomas L.: *See—*
Davis, Richard W.; and Muir, Thomas L., 3,960,268.

Mukai, Junji: *See—*
Numata, Shunichi; Yokono, Hitoshi; Mukai, Junji; Muroi, Tadashi; Nakano, Mineo; and Manabe, Mikio, 3,960,982.

Muller-Frank, Ulrich: *See—*
Lohnert, Gunter; Muller-Frank, Ulrich; and Heil, Jurgen, 3,960,656.

Muller, Jacob: *See—*
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Muller, Peter: *See—*
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Muller, Walter: *See—*
Mayr, Hubert; Presoly, Elfriede; Weinrotter, Ferdinand; Muller, Walter; Stern, Gerhard; and Frohner, Walter Mizzi, deceased, 3,960,541.

Munzner, Heinrich; Heimbach, Heinrich; Korbacher, Werner; Peters, Werner; Juntgen, Harald; Knoblauch, Karl; and Zundorf, Dieter, to Bergwerksverband GmbH. Carbon-containing molecular sieves. 3,960,522, Cl. 55-68.000.

Munzner, Heinrich; Heimbach, Heinrich; Korbacher, Werner; Peters, Werner; Juntgen, Harald; Knoblauch, Karl; and Zundorf, Dieter, to Bergwerksverband GmbH. Carbon-containing molecular sieves. 3,960,769, Cl. 252-444.000.

Murata, Moriyasu; Yamanaka, Makoto; and Sai, Fumio, to Kao Soap Co., Ltd. Non-caking alkyl ether sulfate-containing detergent composition. 3,960,780, Cl. 252-532.000.

Murata, Nobuyuki; and Saito, Makoto, to Sony Corporation. Static magnetic erasing head. 3,961,374, Cl. 360-118.000.

Muroi, Tadashi: *See—*
Numata, Shunichi; Yokono, Hitoshi; Mukai, Junji; Muroi, Tadashi; Nakano, Mineo; and Manabe, Mikio, 3,960,982.

Murray, Pierre Charles, to Illinois Tool Works Inc. Fastener feeding and driving attachment. 3,960,191, Cl. 144-32.00R.

Murray, William M. Compression bone staples and methods of compressing bone segments. 3,960,147, Cl. 128-92.00B.

Murrell, Nicholas John. Solid-state display for time-piece. 3,959,963, Cl. 58-50.00R.

Mutter, Manfred: *See—*
Bayer, Ernst; and Mutter, Manfred, 3,960,830.
Myer, Jon H., to Hughes Aircraft Company. Mechanically actuated magnetocrystalline counter. 3,961,316, Cl. 340-174.0TF.
Myers, David M.: *See—*
Lamping, Harold D.; and Myers, David M., 3,960,115.
Naas, Erling, to A/S Hydraulik Brattvaag. Winch drum provided with side flanges and a separate flange. 3,960,340, Cl. 242-117.000.
Nace, Barry J.: *See—*
Donovan, James W., 3,960,133.
Nace, Donald M.: *See—*
Gross, Benjamin; Jacob, Solomon M.; Nace, Donald M.; and Voltz, Sterling E., 3,960,707.
Naf, Ferdinand; Ohloff, Gunther; and Eschenmoser, Albert, to Firmenich S.A. Process for the preparation of poly-unsaturated hydrocarbons. 3,960,977, Cl. 260-677.00R.
Nagai, Yohei; and Kawamura, Kiyoshi, to Nippon Gakki Seizo Kabushiki Kaisha. Keyboard arrangement having after-control signal detecting sensor in electronic musical instrument. 3,960,044, Cl. 84-1.010.
Nagasaka, Yukio: *See—*
Nishiumi, Yoshio; and Nagasaka, Yukio, 3,960,326.
Nagasawa, Takeshi; Kuroiwa, Katumasa; and Narita, Kouichi, to Nitto Boseki Co., Ltd. Process for acylation of amino, imino and hydroxyl groups using pyrimidine derivatives. 3,960,829, Cl. 260-112.50R.
Nagata, Masayoshi: *See—*
Suzuki, Gyoji; Nagata, Masayoshi; Tomotsu, Takeshi; and Ono, Hisatake, 3,960,559.
Nagata, Takashi; and Mindlin, Raymond David, to Matsushita Electric Industrial Co., Ltd. Piezoelectric dot resonator driven at a harmonic overtone. 3,961,210, Cl. 310-9.500.
Nagy, Jozsef: *See—*
Pataki, Zsuzsa, nee Nagy; Windisch, Ferenc; Nagy, Jozsef; Kecskemethy, Geza; and Virag, Gyorgy, 3,960,630.
Naidich, Herbert H., to United Technologies Corporation. High resolution sector scan radar. 3,961,329, Cl. 343-11.00R.
Naito, Takayuki; Nakagawa, Susumu; and Toda, Soichiro, to Bristol-Myers Company. Butirosin A 3″,5″-O-isopropylidene derivatives. 3,960,833, Cl. 260-210.0AB.
Najour, Gerald Costa; and Witt, Peter Ray, to Emery Industries, Inc. Flame resistant linear polyesters. 3,960,806, Cl. 260-40.00P.
Nakagawa, Masao: *See—*
Isukamoto, Hiroji; Morikawa, Hisashi; Nakagawa, Masao; Kato, Shinji; Miyamoto, Masaki; Yoda, Toichiro; and Yoshihara, Katsuhiko, 3,960,787.
Nakagawa, Susumu: *See—*
Naito, Takayuki; Nakagawa, Susumu; and Toda, Soichiro, 3,960,833.
Nakagawa, Yunosuke; and Sato, Koitsu, to Kao Soap Co., Ltd. Bleaching composition. 3,960,743, Cl. 252-99.000.
Nakajima, Mikio; and Kuwabara, Kiyoaki, to Nippon Carbide Kogyo Kabushiki Kaisha. Method for treating pulp-containing waste liquors. 3,960,648, Cl. 162-29.000.
Nakamura, Kenichiro: *See—*
Kuwagata, Masahiro; Yamada, Masao; Nakamura, Kenichiro; and Kawakami, Yorisada, 3,961,354.
Nakamura, Masao, to Dow Chemical Company, The. Plastic foam. 3,960,792, Cl. 260-2.50E.
Nakamura, Yoshuhara: *See—*
Sueyoshi, Tohru; Nakazawa, Yoshiyuki; Nakamura, Yoshuhara; Ohi, Reiichi; and Kondo, Tokiharu, 3,960,568.
Nakano, Mineo: *See—*
Numata, Shunichi; Yokono, Hitoshi; Mukai, Junji; Muroi, Tadashi; Nakano, Mineo; and Manabe, Mikio, 3,960,982.
Nakanome, Takemi: *See—*
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Nakazawa, Tetsuo; and Nishida, Osamu, to Hitachi, Ltd. Process for regulating hardening speed of self-hardening mold. 3,960,798, Cl. 260-29.6BM.
Nakazawa, Yoshiyuki: *See—*
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Narahari, Gattu, to Sycon Corporation. Wheel suspension system. 3,960,389, Cl. 280-697.000.
Nard Institute, Ltd.: *See—*
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Nardi, Frank: *See—*
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Nash, John E.; and Reader, Trevor D., to Star Dental Manufacturing Co., Inc. Collet wrench. 3,960,039, Cl. 81-52.40R.
Nasir, Syed Shahid; and Wilken, Leon Otto, Jr., to Auburn Research Foundation. Method of tabletting using gluconolactone as the direct compression diluent. 3,961,004, Cl. 264-115.000.
National Airoil Burner Company, Inc.: *See—*
Straitz, John F., III; and Shakiba, Hosein M., 3,960,064.
National Can Corporation: *See—*
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National Petro Chemicals Corporation: *See—*
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National Semiconductor Corporation: *See—*
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National Starch and Chemical Corporation: *See—*
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National Steel Corporation: *See—*
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Naus, Hubert W.; and Hawkins, John L., Jr., to International Telephone and Telegraph Corporation. Electrical connector. 3,960,428, Cl. 339-90.00R.
Navi, Menashe, to ANPA Research Institute. Folded article dispensing machine. 3,960,291, Cl. 221-36.000.
Nawazima, Takeaki: *See—*
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Speraw, Floyd G.; Hess, Thomas M.; and Sampson, Harold J., 3,960,420.
Neale, Patrick S., to Goodyear Tire & Rubber Company, The. Balanced three-ply bias tire. 3,960,194, Cl. 152-355.000.
Need, Omar U., III: *See—*
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Nelson, Thomas N. Carrying case for darts. 3,960,271, Cl. 206-315.00R.
Nerio, Arnif G. Manually propelled toy snow vehicle. 3,960,387, Cl. 280-12.140.
Netting, David I.; and Hertzenberg, Elliot P., to Philadelphia Quartz Company. Method of preparing modified hollow, largely spherical particles by spray drying. 3,960,583, Cl. 106-122.000.
Neubrand, Franz, to Daimler-Benz Aktiengesellschaft. Regenerative heat exchanger of a gas turbine. 3,960,209, Cl. 165-8.000.
New Registon Company, Limited, The: *See—*
Ukita, Junichi, 3,960,517.
Newell, Harold R., to Mesur-Matic Electronics Corporation. Hybrid step motor system. 3,961,232, Cl. 318-46.000.
Newhall, William F., to Amchem Products, Inc. Limonene derivatives used in growth inhibition and plant abscission processes. 3,960,539, Cl. 71-76.000.
Newington, Timothy John; and van der Walt, Nicolaas Tjaart. Fire detector having means for heating the support member of an electrode to prevent formation of moisture thereon. 3,961,195, Cl. 250-385.000.
Newman, Norman: *See—*
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Nienow, James O.; and Yundt, Deryl S., to Roofmaster Inc. Portable heating and spraying apparatus and method for applying highly viscous coating material. 3,960,325, Cl. 239-13.000.
Nigata Engineering Co., Ltd.: *See—*
Chino, Shigeru; Miyazaki, Nobuto; and Takahashi, Tadaya, 3,960,176.
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Nintendo Co., Ltd.: *See—*
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Nippon Carbide Kogyo Kabushiki Kaisha: *See—*
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Nippon Electric Company Limited: *See—*
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Nippon Gakki Seizo Kabushiki Kaisha: *See—*
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Nippon Gohsei Kagaku Kabushiki Kaisha: *See—*
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Nippon Mining Co., Ltd.: *See—*
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Nippon Steel Corporation: *See—*
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Nippon Zeon Co., Ltd.: *See—*
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Nippondenso Co., Ltd.: *See—*
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Nisan Motor Co., Ltd.: *See—*
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Nishimura, Kenji; Arai, Mikio; Sasahara, Kunihiro; and Nitanai, Takashi, to Interx Research Corporation. Effervescent enteric coated L-dopa formulation and method of using the same. 3,961,041, Cl. 424-35.000.

Nishimura, Yoichi: *See—*
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Nishimura, Yuji: *See—*
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Nishiumi, Yoshio; and Nagasaka, Yukio, to Atom Chemical Paint Co., Ltd. Apparatus for paint application. 3,960,326, Cl. 239-214.000.

Nishizawa, Tsutomu: *See—*
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Nixdorf Computer AG: *See—*
Holland-Letz, Guenter, 3,960,304.

Noakes, John E., to Bicron Corporation. High efficiency scintillation detectors. 3,960,756, Cl. 252-301.180.

Noecker, Marshall V.; Thom, Kenneth C.; and Harp, Charles, Jr., to Kaufmann Window and Door Corporation. Tilt window. 3,959,926, Cl. 49-181.000.

Noel, Francois Gilbert. Vented umbrella. 3,960,162, Cl. 135-35.00V.

Nohda, Masao, to Nippon Kogaku K.K. Lens meter with target orthogonalizer. 3,960,450, Cl. 356-126.000.

Nohmi Bosai Kogyo Co. Ltd.: *See—*
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Nomura, Etsuji; Aramaki, Masaharu; and Nishimura, Yuji, to Mitsui Mining & Smelting Co., Ltd. Method for producing electrolytic high purity lead using large-sized electrodes. 3,960,681, Cl. 204-114.000.

Nord, Eric T., to Nordson Corporation. Thermoplastic dispenser. 3,960,296, Cl. 222-146.0HE.

Nordgren, Peter, to AB Gustavsbergs Fabriker. Improvements in and relating to dry closets. 3,959,829, Cl. 4-131.000.

Nordin, Lars-Erik: *See—*
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Nord, Eric T., 3,960,296.

Nordstrom, Kjell Helge, to Transearch AB. Shear beam load cell. 3,960,228, Cl. 177-211.000.

Noren, Carl Anders, to Atlas Copco Aktiebolag. Cutters and methods of cutting. 3,960,407, Cl. 299-17.000.

Norman, Lowell R. Portable structure. 3,960,161, Cl. 135-1.00R.

Norris, Gary G.: *See—*
Beatty, Bobby D.; Daniel, Russell D.; Humerickhouse, Billy J.; and Norris, Gary G., 3,960,087.

Norris, J. Robert, Jr.; and Wasserman, Noa, to Norris, J. Robert, Jr.; and Wasserman, Noa. Message display system. 3,959,906, Cl. 40-125.00A.

Norris, Kenneth Edward. Incipient shear pin failure indicating means. 3,960,456, Cl. 403-27.000.

North American Culvert Corporation: *See—*
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North Electric Company: *See—*
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Norton Company: *See—*
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Nos, Rudolph, to Lawrence Peska Associates, Inc., a part interest. Inflatable air mattress. 3,959,835, Cl. 5-368.000.

Nothern Electric Company Limited: *See—*
MacKenzie, Morley Scott; Charron, Louis Donald; Dooley, Andrew Philip Charles; and Lee, John Davidson, 3,960,431.

Novanex Automation N.V.: *See—*
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Novello, Frederick C., to Merck & Co., Inc. 7-Mercapto(or thio)-benzothiadiazine products. 3,960,854, Cl. 260-243.00D.

Novex Talalmanyfejleszto es Ertekesito Kulkereskedelmi Rt.: *See—*
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Nuclear Diagnostics, Inc.: *See—*
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Numata, Saburo; and Fujino, Shinichiro, to Fuji Photo Optical Co., Ltd. Automatic shutter speed control means for a camera. 3,961,341, Cl. 354-51.000.

Numata, Shunichi; Yokono, Hitoshi; Mukai, Junji; Muroi, Tadashi; Nakano, Mineo; and Manabe, Mikio, to Hitachi, Ltd.; and Hitachi Chemical Company, Ltd. Thermosetting resins. 3,960,982, Cl. 260-838.000.

Nuova San Giorgio S.p.A.: *See—*
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Nussbaum, Lucian. Apparatus for brazing hardened tips to surfaces. 3,960,310, Cl. 228-6.00R.

Nutzel, Karl: *See—*
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N.V. Hollandse Signaalapparaten: *See—*
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Nysted, Leonard N., to G. D. Searle & Co. 6-Aminomethylated 3-oxygenated cholest-5-enes. 3,960,904, Cl. 260-397.200.

Oaks, Seibert S.: *See—*
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Oates, William Lee, to RCA Corporation. Method of assembling a liquid crystal cell. 3,960,534, Cl. 65-43.000.

O'Brien, Robert J.; Lelewski, Stanley, Jr.; and LaFleur, Bob A., to Eastman Kodak Company. Method for producing improved electrographic developer. 3,960,738, Cl. 252-62.10P.

O'Brien, Rory Morgan: *See—*
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O'Connor, John Vincent; and Zolnick, Edmund Joseph, to Johns-Manville Corporation. Belling assembly and method of forming a bell end. 3,960,472, Cl. 425-393.000.

O'Connor, Sean J.: *See—*
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Oettinger, Willi: *See—*
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Ogata, Yasuhiro; and Hayashi, Takao, to Fuji Photo Film Co., Ltd. Process for separating a number of sheets into groups. 3,960,638, Cl. 156-305.000.

Ogawa, Masaya; Wada, Kenichi; and Yasue, Yoshihiko, to Minolta Camera Kabushiki Kaisha. Electrostatic copying apparatus. 3,960,446, Cl. 355-13.000.

Ohashi, Kengo: *See—*
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Ohashi, Takashi: *See—*
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Sueyoshi, Tohru; Nakazawa, Yoshiyuki; Nakamura, Yoshuhara; Ohi, Reiichi; and Kondo, Tokiharu, 3,960,568.
Ohigashi, Tugio; and Ariga, Junichi, to Matsushita Electric Industrial Co., Ltd. VHF-UHF switching mechanism of a television receiver. 3,961,265, Cl. 325-452.000.
Ohio State University Research Foundation, The: *See*—
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Ohkawa, Tetsusi: *See*—
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Ohloff, Gunther: *See*—
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Ohotsubo, Junichirow, to Nard Institute, Ltd. Process for the preparation of a saturated polycyclic carboxylic acid. 3,960,920, Cl. 260-464.000.
Ohtomo, Koichiro, to Kanebo, Ltd. Radiation shielding phenolic fibers and method of producing same. 3,961,123, Cl. 428-224.000.
Ohyama, Miyoji; Uchida, Yushi; and Onodera, Tateo, to Nippon Electric Company Limited. Synchronized demodulation system. 3,961,135, Cl. 178-7.30R.
Oishi, Yasushi; Ohi, Reiichi; and Kosuge, Yoshio, to Fuji Photo Film Co., Ltd. Color photographic silver halide light-sensitive materials. 3,960,570, Cl. 96-100.000.
Okada, Ichiro. Fabric-marking apparatus. 3,960,038, Cl. 81-9.220.
Okada, Masayasu; and Inoue, Hisao, to Hitachi, Ltd. Method of starting operation for a pump or a pump turbine. 3,960,463, Cl. 415-1.000.
Okaya Denki Sangyo Kabushiki Kaisha: *See*—
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Okuhara, Shinzi; and Ohhinata, Ichiro, to Hitachi, Ltd. Semiconductor integrated circuit device. 3,961,357, Cl. 357-50.000.
Okumura, Akio; Yokota, Yukio; Inouye, Kozo; Shiba, Keisuke; and Yamada, Minoru, to Fuji Photo Film Co., Ltd. Silver halide color photographic light-sensitive material. 3,960,571, Cl. 96-100.000.
Okuno, Noboru; Kamogawa, Toshiro; and Kamisaka, Kosei, to Matsushita Electric Industrial Co., Ltd. Video signal processing system for reproducing a video signal from a bandwidth limited recorded signal. 3,961,359, Cl. 358-4.000.
Olin Corporation: *See*—
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Gavin, David F., 3,960,963.
Kircher, Morton S.; and Engler, Maynard F., 3,960,697.
Knollmueller, Karl O., 3,960,913.
Kyi, Roland R., 3,960,869.
Saeman, Walter C., 3,960,502.
Olsen, Ronald H.; and Rothchild, Harold, to Microlife Technics, Inc. Bacterial product useful for making sausage. 3,960,664, Cl. 195-59.000.
Olson, Donald C., to Shell Oil Company. Electrochemical detector for lead alkyls. 3,960,690, Cl. 204-195.00R.
Olson, Gary Lee; and Saucy, Gabriel, to Hoffmann-La Roche Inc. Process for producing a sulfone derivative of vitamin A alcohol. 3,960,967, Cl. 260-607.00R.
Olson, Richard A. Lawn sprinkler programmer. 3,960,327, Cl. 239-236.000.
Olson, Verl O.: *See*—
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Olsson, Curt: *See*—
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Terada, Masaaki, 3,960,143.
O'Mant, Derrick Michael, to Imperial Chemical Industries Limited. Phenyl-thienyl-alkanoic acid derivatives and phenyl-furyl-alkanoic acid derivatives. 3,960,893, Cl. 260-332.20A.
Omodei-Sale', Amedeo: *See*—
Pifferi, Giorgio; Omodei-Sale', Amedeo; and Consonni, Pietro, 3,960,858.
O'Neil, Bryan L. Magnetic ski binding. 3,960,383, Cl. 280-612.000.
Ono, Hisatake: *See*—
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Ono, Mikiya: *See*—
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Ono, Yoshiaki, to Fuji Photo Film Co., Ltd. Diffusion transfer color film unit with hydroxy substituted alkylene amino development accelerators. 3,960,569, Cl. 96-77.000.
Ono, Yuichi: *See*—
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Orban, Ivan; Lind, Hanns; Brunetti, Heimo; and Rody, Jean, to Ciba-Geigy Corporation. Process for the preparation of 2,2,6,6-tetramethyl-4-oxopiperidine. 3,960,875, Cl. 260-293.890.
Oriolo, Enzo: *See*—
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Orlov, Naum Yakovlevich: *See*—
Sloevsky, Fedor Ignatievich; Orlov, Naum Yakovlevich; Gavrish, Petr Dmitrievich; and Rashesky, Anatoly Nikolaevich, 3,960,082.
Ormat Turbines (1965) Ltd.: *See*—
Bronicki, Lucien Y., 3,961,199.
Ormond, Alfred Newman. Platform load cell. 3,960,013, Cl. 73-141.00A.
Oroschakoff, Georgi. Mounting and/or fixing member for a reinforcement or reinforcing element for use in reinforced concrete structures. 3,959,944, Cl. 52-665.000.
Orth, Charles D.; and Treder, Charles F., to Controls Company of America. Pilot operated evaporator pressure regulator. 3,960,169, Cl. 137-491.000.
Orth, Gerhard: *See*—
Kaulig, Heinz; and Orth, Gerhard, 3,959,847.
Ortiz, Nilson, to Niltec Corporation. Airborne toy. 3,959,918, Cl. 46-86.00R.
Ostdiek, Arthur J.; and Cox, Lyndon S., to United States of America, Army. Null adjustable vortex rate sensor. 3,960,022, Cl. 73-505.000.
Ostrow, Paul F. Composite structural member. 3,960,637, Cl. 156-293.00R.
Oswald Forst Maschinenfabrik und Apparatebauanstalt GmbH: *See*—
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Otagoshi, Hitoshi, to Matsushita Electric Industrial Co., Ltd.; and Aoki Electric Industrial Co., Ltd. Portable battery operated electric light. 3,961,175, Cl. 240-10.630.
Otzen, Karl G., to Safety-Kleen Corporation. Disposable filter apparatus. 3,960,728, Cl. 210-167.000.
Ovshinsky, Stanford R.: *See*—
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Owens-Corning Fiberglas Corporation: *See*—
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P. Ferrero & C. S.p.A.: *See*—
Dogliotti, Amilcare, 3,961,089.
P. R. Mallory & Co., Inc.: *See*—
Kloenne, Ernest F.; and Patel, Kanti D., 3,961,327.
Ring, Thomas F., 3,960,105.
Pacanowsky, Eugene: *See*—
Dewitt, Ivan L.; and Pacanowsky, Eugene, 3,960,946.
Pacholok, Jaroslaw, to Bell & Howell Company. Shuttle guard for signature feeder. 3,960,373, Cl. 271-10.000.
Page Engineering Company: *See*—
Rangaswamy, Krishnaswamy, 3,959,899.
Pains-Wessex Limited: *See*—
Elstow, William Rupert Brooke; and Jennings, David Michael, 3,961,259.
Paitson, John Lloyd, to Western Geophysical Company of America. Depth controllers with controllable negative and uncontrollable positive lift-producing means. 3,961,303, Cl. 340-7.0PC.
Pallos, Ferenc M., to Stauffer Chemical Company. Bis-cycloalkylthiocarbamates. 3,960,917, Cl. 260-455.00A.
Palm, Richard Adolf: *See*—
Ripperger, Willi; Oettinger, Willi; Kaiser, Rudolf; Pfitzner, Klaus; and Palm, Richard Adolf, 3,960,768.
Panaccione, Elmer S.: *See*—
Heytmeijer, Herman R.; and Panaccione, Elmer S., 3,961,106.
Panferova, Alexandra Timofeevna: *See*—
Baranova, Rimma Bronislavovna; Lazarev, Vladimir Ilich; Mironov, Nikolai Petrovich; Pinaev, Viktor Alexandrovich; Bugaenko, Lenar Timofeevich; Kalyazin, Evgeny Petrovich; Panferova, Alexandra Timofeevna; Byakov, Vsevolod Mikhailovich; Nikeshichev, Jury Nikolaevich; and Petryaev, Petrovich Evgeny, 3,960,682.
Panicci, Richard L., to Kiddie Products, Inc. Latching receptacle lid. 3,960,289, Cl. 220-318.000.
Papajewski, Reinhold; and Holl, Helmer Heinz, to Singer Company, The. Thread wiper and tension release mechanism for securing machines. 3,960,098, Cl. 112-252.000.
Paris, Rene Antoine: *See*—
Dumont, Louis Claude; Paris, Rene Antoine; and Scharff, Claude Mathilde, 3,960,536.
Parish, Roger C., to SmithKline Corporation. 2,3-Bis-(3-acyl-2-thioureido)-pyridines. 3,961,063, Cl. 424-263.000.
Parke, Davis & Company: *See*—
Woo, Peter W. K., 3,960,837.
Parker, Alan James; Waghorne, Winfield Earle; Giles, Dion Ewing; Sharp, John Howard; Alexander, Robert; and Muir, David Michael, to Anumin Pty. Limited. Method of producing cuprous sulfate and bisulfate solutions. 3,961,028, Cl. 423-41.000.
Parker, William H., to Del Norte Technology, Inc. Oil and gas well disaster valve control system. 3,961,308, Cl. 340-18.0NC.
Parks, Dewey P.; and Scott, Charles R., to Brunswick Corporation. Machine and method for making a laminate structure. 3,960,650, Cl. 162-103.000.

Parnes, Zinaida Naumovna: *See—*
Zavyalov, Sergei Ivanovich; Rodionova, Natalya Alexandrovna; Parnes, Zinaida Naumovna; Bolestova, Galina Ilinichna; Filippov, Vladimir Vasilievich; and Zheleznaya, Lidia Lvovna, 3,960,884.

Pars, Harry George: *See—*
Harris, Louis Selig; Pars, Harry George; Razdan, Raj Kumar; and Sheehan, John Clark, 3,960,871.

Parsels, David L., to Dow Corning Corporation. Method and apparatus for making elongated Si and SiC structures. 3,961,003, Cl. 264-81.000.

Parsons Controls Limited: *See—*
Buschini, Anthony Alan; and Swarsbrick, Douglas Edward, 3,959,909.

Parsons, H. William: *See—*
Shea, Yale R.; Thelen, Arthur B.; and Parsons, H. William, 3,959,943.

Parsons, Vivian. Invalid hammock. 3,959,832, Cl. 5-84.000.

Pasch, Lambert; and Wagemann, Heinz, to Uniroyal A.G. Transfer molding method. 3,961,014, Cl. 264-297.000.

Pascual, Roberto: *See—*
Varotto, Conrado F.; Audero, Miguel Angel; Vasallo, Daniel I.; Pascual, Roberto; and Ruffo, Hector J., 3,960,548.

Pasedach, Heinrich; and Friederang, Albrecht, to BASF Aktiengesellschaft. Manufacture of d,l-methol. 3,960,970, Cl. 260-631.00H.

Passalenti, Beppino: *See—*
Vargiu, Silvio; Carpaneti, Edoardo; and Passalenti, Beppino, 3,960,981.

Passavant-Werke Michelbacher Hutte: *See—*
Schmitt, Walti; and Kreiner, Philipp, 3,960,991.

Pataki, Zsuzsa, nee Nagy; Windisch, Ferenc; Nagy, Jozsef; Kecskemethy, Geza; and Virag, Gyorgy, to Muanyagipari Kutato Intezet; and Fovarosi Muanyagipari Vallalat. process and apparatus for the production of wound sandwich structures. 3,960,630, Cl. 156-190.000.

Patel, Kanti D.: *See—*
Kloenne, Ernest F.; and Patel, Kanti D., 3,961,327.

Patton, Thayer E. Combination temperature and pressure relief valve with energy cutoff switch. 3,961,156, Cl. 219-331.000.

Paules, Eugene H., to ExCel Engineering, Inc. Food packaging machine. 3,959,951, Cl. 53-162.000.

Paulus, Helmut: *See—*
Halberschmidt, Friedrich; Paulus, Helmut; and Feiten, Karl-Josef, 3,960,627.

Pavoni, Gustavo; Repossi, Enzo; and Loiudice, Mario, to Societa Italiana Telecomunicazioni Siemens S.p.A. Circuit arrangement for correcting slip errors in receiver of cyclic binary codes. 3,961,311, Cl. 340-146.10D.

Payet, George Louis, to Strike Corporation, The. Durable press process employing high mositure content fabrics. 3,960,482, Cl. 8-116.400.

Payet, George Louis, to Strike Corporation, The. Durable press process employing alkyl sulfonic or sulfuric acid. 3,960,483, Cl. 8-116.400.

Payne, Frank, to Robertshaw Controls Company. Pollutant emission control system and a combined electric switch and temperature responsive valve thereof. 3,960,124, Cl. 123-117.00A.

Payne, Robert A.; and Slobodzian, Gregory E., to Stewart-Warner Corporation. Color display device. 3,961,365, Cl. 358-56.000.

PCB Piezotronics, Inc.: *See—*
Change, Nicholas D.; and Riggs, Michael T., 3,960,018.

Pearce, Bryan Robert; and Powell, Walter James, to Rolls-Royce (1971) Limited. Gas turbine engine. 3,959,966, Cl. 60-39.320.

Pedersen, Henning Kristen, to Gert Oestergaard, Vejle Plastic. Means for applying labels to a sheet material length. 3,960,641, Cl. 156-362.000.

Pei, Yu Kun: *See—*
Moan, Kenneth L.; and Pei, Yu Kun, 3,960,136.

Pelofsky, Arnold H.: *See—*
Rosen, Bernard H.; Pelofsky, Arnold H.; and Greene, Marvin, 3,960,700.

Pennwalt Corporation: *See—*
Inman, Charles Edward, 3,960,797.
Robinson, Donald Nellis; and Welsh, Charles Benjamin, 3,960,825.
Smith, Harold Vernon, deceased, 3,961,111.

Pepperman, Armand B., Jr.: *See—*
Daigle, Donald J.; Pepperman, Armand B., Jr.; and Vail, Sidney L., 3,961,110.

PEPRO, Societe pour le Developpement et la Vente de Specialites Chimiques: *See—*
Dumont, Louis Claude; Paris, Rene Antoine; and Scharff, Claude Mathilde, 3,960,536.

Perciaccante, Vincent Anthony: *See—*
Augurt, Thomas Anthony; Rosensaft, Michael Norman; and Perciaccante, Vincent Anthony, 3,960,152.

Perfect Equipment Corporation: *See—*
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Perkins, Reginald Louis: *See—*
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Perrey, Hermann: *See—*
Knickel, Birger; Keifer, Siegfried; Perrey, Hermann; Rudolph, Hans; Rosenkranz, Hans Jurgen; and Rudisch, Reinhold, 3,960,590.

Perrin, Gunter, to Daimler-Benz Aktiengesellschaft. Engine exhaust brake for otto-engines operated with gas. 3,960,122, Cl. 123-97.00B.

Perry, John T.; and Schmutzer, Joel J., to Varian Associates. Heat unit integrator for X-ray tubes. 3,961,173, Cl. 235-184.000.

Peters, Werner: *See—*
Munzner, Heinrich; Heimbach, Heinrich; Korbacher, Werner; Peters, Werner; Juntgen, Harald; Knoblauch, Karl; and Zundorf, Dieter, 3,960,522.
Munzner, Heinrich; Heimbach, Heinrich; Korbacher, Werner; Peters, Werner; Juntgen, Harald; Knoblauch, Karl; and Zundorf, Dieter, 3,960,769.

Petersen, Rudolf Theodor; and Fleck, Wolfgang, to Beiersdorf Aktiengesellschaft. Phenoxyalkylamine containing pyridines. 3,960,878, Cl. 260-296.0AE.

Peterson, C. Lynn, to Peterson Filters and Engineering Co. Automatic filter level control by dilution with filtrate. 3,960,726, Cl. 210-77.000.

Peterson, C. Lynn; and Peterson, Clarence J., to Peterson Filters and Engineering Co. Flow conducting connectors for disc filter sectors and internal passages of filter shaft. 3,960,729, Cl. 210-232.000.

Peterson, Clarence J.: *See—*
Peterson, C. Lynn; and Peterson, Clarence J., 3,960,729.

Peterson Filters and Engineering Co.: *See—*
Peterson, C. Lynn, 3,960,726.
Peterson, C. Lynn; and Peterson, Clarence J., 3,960,729.

Peterson, William A., Jr., to Bendix Corporation, The. Start air control system. 3,960,130, Cl. 123-179.00A.

Petro-Tex Chemical Corporation: *See—*
Christmann, Harold F.; and Miklas, Edward J., 3,960,767.
Ellis, Michael C.; and Manning, Harold E., 3,960,776.
Manning, Harold E., 3,960,975.

Petrocci, Alfonso N.: *See—*
Green, Harold A.; Merianos, John J.; and Petrocci, Alfonso N., 3,961,042.

Petrovic, Louis John: *See—*
Agarwal, Jagdish Chandra; Giberti, Richard Andre; and Petrovic, Louis John, 3,960,513.

Petrow, Henry G.; and Allen, Robert J. Colloidal sol antimony pentaoxide flameproofing compositions. 3,960,989, Cl. 260-884.000.

Petrushevskava, Valentina Sergeevna: *See—*
Petrushevsky, Georgy Sergeevich; and Petrushevskava, Valentina Sergeevna, 3,960,045.

Petrushevsky, Georgy Sergeevich; and Petrushevskava, Valentina Sergeevna. Register switching device for a reed musical instrument. 3,960,045, Cl. 84-376.0SM.

Petryaev, Petrovich Evgeny: *See—*
Baranova, Rimma Bronislavovna; Lazarev, Vladimir Ilich; Mironov, Nikolai Petrovich; Pinaev, Viktor Alexandrovich; Bugaenko, Lenar Timofeevich; Kalyazin, Evgeny Petrovich; Panferova, Alexandra Timofeevna; Byakov, Vsevolod Mikhailovich; Nikeshichev, Jury Nikolaevich; and Petryaev, Petrovich Evgeny, 3,960,682.

Petryoev, Evgeny Petrovich: *See—*
Baranova, Rimma Bronislavovna; Lazarev, Vladimir Ilich; Mironov, Nikolai Petrovich; Pinaev, Viktor Alexandrovich; Bugaenko, Lenar Timofeevich; Kalyazin, Evgeny Petrovich; Panferova, Alexandra Timofeevna; Byakov, Vsevolod Mikhailovich; Nikeshichev, Jury Nikolaevich; and Petryaev, Petrovich Evgeny, 3,960,682.

Pfitzner, Klaus: *See—*
Ripperger, Willi; Oettinger, Willi; Kaiser, Rudolf; Pfitzner, Klaus; and Palm, Richard Adolf, 3,960,768.

Pfizer Inc.: *See—*
Berg, Rudolph G., 3,960,901.
Cox, David Alexander; Danilewicz, John Christopher; Ham, Allan Leslie; Kemp, John Edward Glyn; and Snarey, Michael, 3,961,072.
Danilewicz, John Christopher; Kemp, John Edward Glyn; and Wright, James Robert, 3,960,861.
Kuhla, Donald E.; and Sarges, Reinhard, 3,961,065.
Kuhla, Donald E.; Sarges, Reinhard; and Wiedermann, Hans E., 3,961,067.
Richardson, Kenneth, 3,960,958.

Pflasterer, Peter W., to Tennelec, Inc. Crystalless scanning radio receiver. 3,961,261, Cl. 325-335.000.

Pflug, Irving J. Method and apparatus for sterility monitoring. 3,960,670, Cl. 195-103.50R.

Philadelphia Quartz Company: *See—*
Lazet, Frank J., 3,960,532.
Netting, David I.; and Hertzenberg, Elliot P., 3,960,583.
Pierce, Richard H., 3,961,022.

Phillips Cables Limited: *See—*
Beach, Shirley, 3,961,128.

Phillips, Edwin D. Bottle cap with means to effect seal with irregular bottle ends. 3,960,288, Cl. 215-329.000.

Phillips, Eugene N., to Rockwell International Corporation. Loom picker retainer. 3,960,184, Cl. 139-159.000.

Phillips, Mitchell E.: *See—*
Beitz, Donald C.; and Phillips, Mitchell E., 3,960,493.

Phillips Petroleum Company: *See—*
Bertus, Brent J.; Farha, Floyd, Jr.; and Johnston, Harlin D., 3,960,773.
Bresson, Clarence R., 3,960,719.
Reece, Jack E.; and Fozzard, George B., 3,960,881.
Schiff, Sidney, 3,960,937.
Stapp, Paul R., 3,960,972.

Stapp, Paul R., 3,960,973.
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Photocircuits Division of Kollmorgan Corporation: *See*—
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Photocircuits Division of Kollmorgen Corporation: *See*—
Kremer, Richard K.; and Zeblisky, Rudolph J., 3,961,109.

Piaget, Robert E.; and Clyburn, Charles W., to I.C.M. Industries, Inc., a part interest. Retainer for an end fitting of a welding cable. 3,960,427, Cl. 339-39.000.

Piccinini, Carlo; Morelli, Morello; and Rebora, Pierluigi, to Snam Progetti S.p.A. Catalyst for the production of ethylene oxide. 3,960,775, Cl. 252-463.000.

Pierce, Richard H., to Philadelphia Quartz Company. Silicate dissolving. 3,961,022, Cl. 423-332.000.

Pierce, Victor J.: *See*—
Caccavale, John L.; Pierce, Victor J.; Young, Robert W.; and Prussin, Samuel B., 3,961,091.

Pierle, Willy R. J.: *See*—
Keijzer, Johan H.; Pierle, Willy R. J.; and Van de Voorde, G., 3,960,385.

Pifferi, Giorgio; Omodei-Sale', Amedeo; and Consonni, Pietro, to Gruppo Lepetit S.p.A. 3-Hetero acyl-2,3-benzoxazepines. 3,960,858, Cl. 260-247.20B.

Pike, Thomas W.: *See*—
Gundlach, Robert W.; Whited, Charles A.; and Pike, Thomas W., 3,960,444.

Pinaev, Viktor Alexandrovich: *See*—
Baranova, Rimma Bronislavovna; Lazarev, Vladimir Ilich; Mironov, Nikolai Petrovich; Pinaev, Viktor Alexandrovich; Bugaenko, Lenar Timofeevich; Kalyazin, Evgeny Petrovich; Panferova, Alexandra Timofeevna; Byakov, Vsevolod Mikhailovich; Nikeshichev, Jury Nikolaevich; and Petryaev, Petrovich Evgeny, 3,960,682.

Pinney, Baden McDowall, to Du Pont of Canada Limited. Regulating the flow of molten polyamides in a continuous process for the preparation thereof. 3,960,820, Cl. 260-78.00R.

Piotrowski, Tadeusz Wiktor, to Cincinnati Milacron, Inc. Seal method and apparatus. 3,960,381, Cl. 277-1.000.

Pissiotas, Georg: *See*—
Duerr, Dieter; and Pissiotas, Georg, 3,960,947.

Pitney-Bowes, Inc.: *See*—
Zucker, Fredric E.; Storace, Anthony; and Sette, Paul R., 3,960,227.

Plank, Charles J.: *See*—
Givens, Edwin N.; Plank, Charles J.; and Rosinski, Edward J., 3,960,978.

Planke, Tore. Apparatus for conveying articles. 3,960,261, Cl. 198-26.000.

Plant, Howard L.; and Bell, Allyn R., to Uniroyal Inc. Herbicidal 2-sulfinyl and 2-sulfonyl pyridine N-oxide derivatives. 3,960,542, Cl. 71-94.000.

Plastic-Fabrik Elbenia GmbH & Co., Inc.: *See*—
Thelen, Adam, 3,960,341.

Plastics Development Corporation of America: *See*—
Michaelis, David E., 3,961,118.

Plate Kofasil Gesellschaft mit beschrankter Haftung: *See*—
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Plattner, Robert F.; Arend, Raymond J.; and Verberkmoes, John A., to Bastian-Blessing. Leg assemblies for cabinets. 3,960,352, Cl. 248-188.000.

Platz, Rolf: *See*—
Fuchs, Werner; Platz, Rolf; and Vogt, Volker, 3,960,916.

Pless, Janos, to Sandoz Ltd. N,N'-bis 6-[(3,4-dihydroxyphenyl)alkylamino]-hexyl hexamethylenediamines and the salts thereof. 3,960,959, Cl. 260-570.50P.

Plessey Handel und Investments A.G.: *See*—
Blatt, Victor, 3,961,351.

Plessey Incorporated: *See*—
Fraioli, Anthony V., 3,961,301.

Ploger, Walter; Schmidt-Dunker, Manfred; and Gloxhuber, Christian, to Henkel & Cie G.m.b.H. Pyrrolidone-5,5-diphosphonic acids. 3,960,888, Cl. 260-326.50A.

Plympton, Michael R., to ACF Industries, Incorporated. Valve locking device. 3,960,168, Cl. 137-385.000.

Pocock, Robert E.: *See*—
Ross, David F.; and Pocock, Robert E., 3,960,500.

Podolan, Edward G.: *See*—
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Pogge, H. Bernhard: *See*—
Aboaf, Joseph A.; Broadie, Robert W.; Hull, Edward M.; and Pogge, H. Bernhard, 3,961,353.

Pohl, Dieter, to Robert Bosch G.m.b.H. Testing electrical ignition systems of internal combustion engines. 3,961,240, Cl. 324-16.00R.

Pokhodenko, Vladimir Nikiforovich; and Tselik, Ivan Nikiforovich. Method of producing basic zirconium carbonate. 3,961,026, Cl. 423-419.000.

Polaroid Corporation: *See*—
Cardone, Paul A., 3,960,558.
Forsyth, Robert P.; and Rose, Gilbert A., Sr., 3,961,349.
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Polezhaeva, Antonina Ivanovna: *See*—
Gortinskaya, Tatyana Vladimirovna; Mashkovsky, Mikhail Davidovich; Polezhaeva, Antonina Ivanovna; Nyrkova, Valentina Georgievna; Bondar, Larisa Nikolaevna; Litova, Galina Nikolaevna; Schukina, Maria Nikolaevna, deceased; and Preobrazhenskaya, Maria Nikolaevna, administrator, 3,961,058.

Polinsky, Murray Arthur, to RCA Corporation. Leakage current prevention in semiconductor integrated circuit devices. 3,961,358, Cl. 357-53.000.

Politechnika Lodzke: *See*—
Brzeski, Lech Andrzej; Kazimierski, Zbyszko Kazimierz; Krysinski, Jan Eugeniusz; and Siwek, Andrzej Witold, 3,960,414.

Pollard, Eula Mae. Novel hair grooming composition, and a method and an instrument employing the same. 3,960,154, Cl. 132-9.000.

Pollitzer, Ernest L.; and Hayes, John C., to Universal Oil Products Company. Hydrocarbon conversion with an acidic multimetallic catalytic composite. 3,960,710, Cl. 208-139.000.

Pollitzer, Ernest L.: *See*—
Antos, George J.; Hayes, John C.; and Pollitzer, Ernest L., 3,960,711.

Polysar Limited: *See*—
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Popplewell, James M.: *See*—
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Porath, Jerker Olof; and Rosengren, Jan Gunnar, to Exploaterings Aktiebolaget T.B.F. Gel product for separation purposes and method of using the product for hydrophobic salting out adsorption. 3,960,720, Cl. 260-112.50R.

Pornin, Rene: *See*—
Bourdeau, Jean Paul; Seris, Jean Louis; and Pornin, Rene, 3,960,666.

Porrmann, Herbert: *See*—
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Port, David J.; Lafferty, William D.; and Cheney, Richard F., to GTE Sylvania Incorporated. Cermet plasma flame spray powder, method for producing same and articles produced therefrom. 3,960,545, Cl. 75-.50R.

Porta Systems Corporation: *See*—
DeLuca, Paul V.; and Carney, William V., 3,961,227.

Portalier, Robert, to Societe de Vente de l'Aluminium Pechiney. Injection device for molding machines. 3,960,201, Cl. 164-312.000.

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Porter, W. Fergus: *See*—
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Potin, Philippe; and Biensan, Michel, to Ato Chimie. Method for purifying lactams. 3,960,846, Cl. 260-239.30A.

Pouille, Georges. Synthetic chinchilla fur production by reverse side application of dye solution. 3,960,478, Cl. 8-14.000.

Powell, Walter James: *See*—
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Powers, Robert W.: *See*—
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PPG Industries, Inc.: *See*—
Dowbenko, Rostyslaw; and Marchetti, Joseph R., 3,960,795.
Hearn, Ralph E.; and McMillen, Clarence, 3,961,120.
Truett, William Lawrence, 3,960,740.

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Preobrazhenskaya, Maria Nikolaevna, administrator: *See*—
Gortinskaya, Tatyana Vladimirovna; Mashkovsky, Mikhail Davidovich; Polezhaeva, Antonina Ivanovna; Nyrkova, Valentina Georgievna; Bondar, Larisa Nikolaevna; Litova, Galina Nikolaevna; Schukina, Maria Nikolaevna, deceased; and Preobrazhenskaya, Maria Nikolaevna, administrator, 3,961,058.

Presoly, Elfriede: *See*—
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Preussag Aktiengesellschaft: *See*—
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Prezewowsky, Klaus: *See*—
Engel, Klaus; Prezewowsky, Klaus; Laurent, Henry; and Nishino, Yukishige, 3,960,841.

Preziosi, Joseph R.: *See*—
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PRF, Inc.: *See*—
Cacciola, John; and Thomas, David W., 3,961,287.

Prichard, Amelia A.: *See*—
Prichard, Harry A., Jr., deceased; and Prichard, Amelia A., 3,960,355.

Prichard, Harry A., Jr., deceased; and by Prichard, Amelia A. Scaffold supporting waler bracket. 3,960,355, Cl. 249-189.000.

Pridantsev, Mikhail Vasilievich: *See—*
Levin, Felix Lvovich; Golovanenko, Sergei Alexandrovich; Pridantsev, Mikhail Vasilievich; and Dmitriev, Vladimir Alexandrovich, 3,960,617.
Prochazka, Svante, to General Electric Company. Dense polycrystalline silicon carbide. 3,960,577, Cl. 106-44.000.
Procter & Gamble Company, The: *See—*
Daley, Edwin W.; and Yowler, M. Pauline, 3,960,782.
Wiedamann, Karl Edward, 3,960,646.
Produits Chimiques Ugine Kuhlmann: *See—*
Hardouin, Jean-Claude Henri Raoul; and Vallette, Maurice Rene Jean, 3,960,952.
Huille, Michel Ernest Antoine; and Cabut, Louis Antoine, 3,960,587.
Prugh, John D., to Merck & Co., Inc. 1 Alkyl-4-(10:oxo or hydroxy-10,11-dihydro-5H-dibenzo[a,d]cyclohepten-5-ylidene)-piperidine compounds. 3,960,872, Cl. 260-293.620.
Prussin, Samuel B.: *See—*
Caccavale, John L.; Pierce, Victor J.; Young, Robert W.; and Prussin, Samuel B., 3,961,091.
Przybysz, Francis C.: *See—*
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Psenka, Joseph A.; and Tersch, Richard W., to Lear Siegler, Inc. Shaving cutter for finishing gears. 3,960,055, Cl. 90-1.60A.
Puckett, Ronnie R. Light and signal device. 3,959,911, Cl. 43-17.000.
Pumphrey, Nicholas William James; and Woods, William Laurence, to Imperial Chemical Industries Limited. Treatment of catalytic anodes. 3,960,680, Cl. 204-98.000.
Purinton, Donald L., to Texas Instruments Incorporated. Radome wire grid having low pass frequency characteristics. 3,961,333, Cl. 343-872.000.
Puskas, Imre; and Cengel, John A., to Standard Oil Company. Polybutenylsuccinic anhydride production. 3,960,900, Cl. 260-346.80R.
Qualitrol Corporation: *See—*
Romanowski, Robert F., 3,960,017.
Quick, Leonard M.: *See—*
McCollum, John D.; and Quick, Leonard M., 3,960,706.
McCollum, John D.; and Quick, Leonard M., 3,960,708.
Raab, Harry F., Jr.: *See—*
Bohanan, Charles S.; Jones, David H.; Raab, Harry F., Jr.; and Radkowsky, Alvin, 3,960,655.
Rabussier, Bernard; and Mandon, Jean-Pierre, to Airwick Industries, Inc. Insecticidal evaporator having a diffusion layer of olefin polymerizate. 3,961,040, Cl. 424-33.000.
Rackson, Chester B. Fluid control apparatus. 3,959,882, Cl. 32-22.000.
Rackstraw, Bernard Booth: *See—*
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Raley, Charles F., Jr.; and Asher, Delman R., to Dow Chemical Company, The. Process for preparing macroporous open-cell carbon foam from .normally crystalline vinylidene chloride polymer. 3,960,770, Cl. 252-444.000.
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Renz, Alfred C.; Spacie, Roy W.; and Fuller, Edward J., to Harris Corporation. First fault indicator for engines. 3,960,011, Cl. 73-116.000.
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Reynier, Jacques; and Guglier, Michel, to SAFT-Societe des Accumulateurs Fixes et de Traction. Button type cell and battery. 3,960,599, Cl. 136-111.000.
Reynolds, Tom, to Lawrence Peska Associates, Inc., a part interest. Ski pole with retractable point. 3,960,382, Cl. 280-11.37P.
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Robison, Howard A. Automotive fan clutch lock. 3,960,465, Cl. 416-169.00R.
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Rogers, Alan Francis, to Spacemaker (Products) Limited. Fence with adjustable vertical panels. 3,960,367, Cl. 256-21.000.
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Rohr, Wolfgang; and Fischer, Adolf, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Substituted sulfonylglycolic acid anilides. 3,960,919, Cl. 260-456.00A.
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Ros, Bonifacio Echavarri, to Orbaiceta, S.A. Gas cock. 3,960,167, Cl. 137-375.000.
Rosback, Donald H., to Universal Oil Products Company. Zeolitic adsorbent for xylene separation. 3,960,774, Cl. 252-455.00Z.
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Rosenberger, Michael; and Saucy, Gabriel, to Hoffmann-La Roche Inc. Aryl ketals of polycyclic oxo compounds and processes. 3,960,896, Cl. 260-340.500.
Rosenblatt, Gordon, to Canadian Porcelain Company Limited. Semiconducting glaze composition. 3,960,779, Cl. 252-521.000.
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Ross, Bernard D. Pipe swaging apparatus. 3,959,998, Cl. 72-312.000.
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Rush, John E., to American Can Company. Machine for decorating two-piece cans. 3,960,073, Cl. 101-40.000.
Rush, Martin A. Solar powered sea water evaporating and condensing unit. 3,960,668, Cl. 202-185.00R.
Russell, Donald H.; and Lenton, R. Warren, to Atlantic Richfield Company. Zinc chloride as catalyst for epoxy/adnc blends. 3,960,813, Cl. 260-47.0EP.
Russell, Joseph Lee; and Kollar, John, to Halcon International, Inc. Process for preparing oximes and hydroxylamines. 3,960,954, Cl. 260-566.00A.
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Sahara, Masayoshi, to Minolta Camera Kabushiki Kaisha. Automatic exposure time control device for use in single lens reflex camera. 3,961,338, Cl. 354-24.000.
Saheki, Toshio: *See*—
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Salomon, Georges Pierre Joseph, to Etablissements Francois Salomon et Fils. Method for providing recoil in a safety binding for skis and device for the same. 3,960,384, Cl. 280-623.000.
Salukvadze, Viktor Samsonovich. Rotary cutting tool. 3,959,862, Cl. 29-105.00R.
Salzer, Erwin, to Chase-Shawmut Company, The. Method and fixture for manufacturing fuses having helically wound fusible elements. 3,959,875, Cl. 29-623.000.
Samour, Carlos M., to Kendall Company, The. Nonionic monomeric emulsion stabilizers. 3,960,935, Cl. 260-485.00G.
Sampei, Tohru, to Hitachi, Ltd. Amplifier circuit having power supply voltage responsive to amplitude of input signal. 3,961,280, Cl. 330-40.000.
Sampson, Harold J.: *See*—
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Sander, Bruno; Berbner, Heinz; and Hoffmann, Manfred, to BASF Aktiengesellschaft. Manufacture of aqueous suspensions of polyolefin fibrids. 3,960,794, Cl. 260-17.300.
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Hiraoka, Tetsuo; and Sugimura, Yukio, 3,960,845.
Sato, Yasunobu; Fujita, Hiroshi; Takagi, Hiromu; and Kamoshita, Katsuo, 3,960,863.
Sano, Takezo; Uemura, Yukikazu; and Furuta, Akihiro, to Sumitomo Chemical Company, Limited; and Hayashibara Biochemical Laboratories, Incorporated. Photosensitive resin composition containing pullulan or esters thereof. 3,960,685, Cl. 204-159.120.
Sansui Electric Co., Ltd.: *See*—
Kurata, Hirotaka, 3,961,276.
Santos, Manuel V. Tensioning, twisting and cutting device for sutures. 3,959,960, Cl. 57-22.000.
Sanyo Electric Co., Ltd.: *See*—
Morioka, Yuji; and Dejima, Shigeo, 3,960,603.
Sarges, Reinhard: *See*—
Kuhla, Donald E.; and Sarges, Reinhard, 3,961,065.
Kuhla, Donald E.; Sarges, Reinhard; and Wiedermann, Hans E., 3,961,067.
Sarycheva, Raisa Grigorievna: *See*—
Fridlyander, Iosif Naumovich; Yatsenko, Konstantin Petrovich; Nekrasova, Galina Anatolievna; Gulin, Alexandr Nikolaevich; Semenova, Zoya Grigorievna; Sidorov, Nikolai Grigorievich; Morozov, Boris Sergeevich; Krichevsky, Efrem Julievich; Zakharova, Tatyana Alexandrovna; and Sarycheva, Raisa Grigorievna, 3,960,551.
Sasahara, Kunihiro: *See*—
Nishimura, Kenji; Arai, Mikio; Sasahara, Kunihiro; and Nitanai, Takashi, 3,961,041.
Sasajima, Kikuo: *See*—
Maruyama, Isamu; Yamamoto, Hisao; Nakao, Masaru; Sakai, Shigeru; Sasajima, Kikuo; Kitagawa, Sumio; and Inaba, Shigeho, 3,960,873.
Sasena, John J., to Eaton Corporation. Fastener for fence construction. 3,959,852, Cl. 24-73.00B.
Saskatchewan Power Corporation: *See*—
Verma, Arun; and Knight, Arthur R., 3,960,494.
Sather, Eugene, to Bell & Howell Company. Locating and locking mechanism for glass flat. 3,960,447, Cl. 355-75.000.
Sato, Hideaki: *See*—
Goshima, Takeshi; Sugiura, Yoshinori; Endo, Kiyonobu; Sato, Hideaki; Kono, Kimio; and Tsuji, Takao, 3,960,443.
Sato, Katsuaki: *See*—
Enei, Hitoshi; Sato, Katsuaki; and Hirose, Yoshio, 3,960,660.
Enei, Hitoshi; Sato, Katsuaki; Ishii, Morikatsu; and Hirose, Yoshio, 3,960,661.
Sato, Koitsu: *See*—
Nakagawa, Yunosuke; and Sato, Koitsu, 3,960,743.

Sato, Kuniaki; Toyama, Kozo; Saheki, Toshio; Mizukoshi, Kaoru; and Suzuki, Shuei, to Kajima Corporation; and Hitachi Metals Ltd. Fittings for connecting columns and beams of steel frame construction. 3,960,458, Cl. 403-189.000.

Sato, Masamichi, to Fuji Photo Film Co., Ltd. Method for producing a photomask. 3,960,560, Cl. 96-36.000.

Sato, Mitsuya; Tanihara, Yozo; and Furihata, Makoto, to Hitachi, Ltd. Synchronizing detector circuit. 3,961,360, Cl. 358-27.000.

Sato, Tadayoshi. Pipe cleaning apparatus. 3,959,840, Cl. 15-104.3SN.

Sato, Yasunobu; Fujita, Hiroshi; Takagi, Hiromu; and Kamoshita, Katsuo, to Sankyo Company Limited. Pyrido[1,2-a]pyrimidinone derivatives. 3,960,863, Cl. 260-256.40F.

Satoh, Shinobu. Method for purification of exhaust gases. 3,961,019, Cl. 423-235.000.

Saucy, Gabriel: *See*—
Olson, Gary Lee; and Saucy, Gabriel, 3,960,967.
Rosenberger, Michael; and Saucy, Gabriel, 3,960,895.
Rosenberger, Michael; and Saucy, Gabriel, 3,960,896.

Sauer, Gerhard: *See*—
Haffer, Gregor; Eder, Ulrich; Laurent, Henry; Ruppert, Jurgen; Sauer, Gerhard; and Wiechert, Rudolf, 3,960,842.

Saukel, Heinz: *See*—
Daubach, Ewald; Saukel, Heinz; and Von Rambach, Leonhard, 3,960,486.

Sauter, Dieter: *See*—
Schmalfeld, Paul; Sauter, Dieter; and Cappel, Fred Erich, 3,960,543.

Sauvanet, Maurice, to Silec-Semi-Conducteurs, Societe Anonyme. Static switch controller synchronized with a passage to zero of the supply voltage. 3,961,235, Cl. 323-18.000.

Savage, Albert B., to Dow Chemical Company, The. Water-dispersible, high molecular weight polymer compositions. 3,960,584, Cl. 106-178.000.

Sawano, Yukio: *See*—
Ueda, Hiroyuki; and Sawano, Yukio, 3,961,161.

Sax, Alan M.; and Stolkin, Walter J., to Stolmar Corporation. Automatic setup carton constructions. 3,960,313, Cl. 229-41.00B.

Saxonmeyer, Wallace J., to Whiting Corporation. Orbital service bridge. 3,960,242, Cl. 182-36.000.

Say, Donald LeRoy, to GTE Sylvania Incorporated. Snubber means for positioning a gun structure in an electron discharge device. 3,961,220, Cl. 313-417.000.

Scambia Industrial Developments AG: *See*—
Bos, Karel; and Smit, Hendrik, 3,959,970.

Scarbrough, Gilbert R. Heat therapy and spinal traction chair. 3,960,145, Cl. 128-68.100.

Schad, Harald: *See*—
Hiller, Sigwart; and Schad, Harald, 3,961,189.

Schaefer, Hans: *See*—
Beschke, Helmut; Schaefer, Hans; Schreyer, Gerd; Schuler, Wilhelm Alfons; and Weigert, Wolfgang, 3,960,766.

Scharff, Claude Mathilde: *See*—
Dumont, Louis Claude; Paris, Rene Antoine; and Scharff, Claude Mathilde, 3,960,536.

Schaub, Bernard: *See*—
Faure, Jacqueline; Malmejac, Yves; and Schaub, Bernard, 3,960,647.

Schaub, Fritz: *See*—
Schelling, Hans-Peter; and Schaub, Fritz, 3,960,906.

Scheinpflug, Hans: *See*—
Kramer, Wolfgang; Draber, Wilfried; Hammann, Ingeborg; and Scheinpflug, Hans, 3,961,061.

Schelling, Hans-Peter; and Schaub, Fritz, to Sandoz Ltd. ω-Aliphatic and cycloaliphatic hydrocarbonoxy-2,6-alkadienoates and 2-alkenoates. 3,960,906, Cl. 260-410.90R.

Schenk, Jakob: *See*—
Leowald, Karl-Friedrich; and Schenk, Jakob, 3,961,204.

Schenk, Raymond L., Jr.; Bruzas, John A.; and Coville, William E., to Gould Inc. Intercell connector assembly for positive displacement casting system. 3,960,602, Cl. 136-134.00R.

Schering Aktiengesellschaft: *See*—
Ahrens, Hanns; Rufer, Clemens; Biere, Helmut; Schroder, Eberhard; Losert, Wolfgang; Loge, Olaf; and Schillinger, Ekkehard, 3,960,949.
Engel, Klaus; Prezewowsky, Klaus; Laurent, Henry; and Nishino, Yukishige, 3,960,841.
Haffer, Gregor; Eder, Ulrich; Laurent, Henry; Ruppert, Jurgen; Sauer, Gerhard; and Wiechert, Rudolf, 3,960,842.
Mueller, Karl Heinz; and Hubert, Hans-Juergen, 3,960,912.

Schexnayder, Lawrence F., to Caterpillar Tractor Co. Fast exhaust circuit for hydraulic jacks. 3,960,059, Cl. 91-443.000.

Schieber, John R., to Betz Laboratories, Inc. Corrosion probe device for boiler gases. 3,960,496, Cl. 23-253.00C.

Schieni, Steven R.: *See*—
Bessant, Glyndwr A. R.; Eichamer, Paul D.; Koros, Robert M.; and Schieni, Steven R., 3,960,508.

Schierholz, Edward A.; and Nardi, Frank, to Honeywell Inc. Integral, self retaining read-out block. 3,960,349, Cl. 248-27.00R.

Schiff, Charles M., to Teleflex Incorporated. Motion transmitting remote control assembly. 3,960,032, Cl. 74-501.00R.

Schiff, Sidney, to Phillips Petroleum Company. Ashless additives for lubricating compositions. 3,960,937, Cl. 260-501.200.

Schiller, Paul: *See*—
Darsow, Gerhard; Schiller, Paul; Reese, Eckart; Bottenbruch, Ludwig; Binsack, Rudolph; Vernaleken, Hugo; and Wank, Joachim, 3,960,815.

Schillinger, Ekkehard: *See*—
Ahrens, Hanns; Rufer, Clemens; Biere, Helmut; Schroder, Eberhard; Losert, Wolfgang; Loge, Olaf; and Schillinger, Ekkehard, 3,960,949.

Schindler, Donald R., to General Electric Company. Method of making non-shorting photoflash lamp. 3,959,860, Cl. 29-25.160.

Schlaf, Guenter: *See*—
Liepe, Friedrich; Langhans, Gerhard; Jagusch, Leonhard; Richter, Klaus; and Schlaf, Guenter, 3,960,175.

Schlueter, David Frederick: *See*—
Benno, Edward Leonard; Schlueter, David Frederick; and Seymour, Lonnie Ray, 3,959,949.

Schmaldienst, Peter: *See*—
Hofer, Walter; Haubner, Georg; and Schmaldienst, Peter, 3,960,129.

Schmalfeld, Paul; Sauter, Dieter; and Cappel, Fred Erich, to Metallgesellschaft Aktiengesellschaft. Process of producing self-supporting briquettes for use in metallurgical processes. 3,960,543, Cl. 75-3.000.

Schmid, Charles. Apparatus for frying food by immersing it in boiling oil. 3,960,137, Cl. 126-387.000.

Schmidt-Dunker, Manfred: *See*—
Ploger, Walter; Schmidt-Dunker, Manfred; and Gloxhuber, Christian, 3,960,888.

Schmidt, Erich, to Maschinenfabrik Zuckermann Komm. Ges. Wien. Programmed contour copying machine. 3,960,188, Cl. 142-7.000.

Schmidt, Heinrich: *See*—
Fleischmann, Johann R.; Fechter, Willy; and Schmidt, Heinrich, 3,959,929.

Schmidt, James L.; Jacoby, Jerold L.; Shaw, Garrett D.; and Bhuta, Pravin G., to TRW Inc. Holographic instrument for measuring stress in a borehole wall. 3,960,448, Cl. 356-32.000.

Schmitt, Walti; and Kreiner, Philipp, to Passavant-Werke Michelbacher Hutte. Rotary aerator. 3,960,991, Cl. 261-92.000.

Schmitz, H. Gunter, to Supfina Maschinenfabrik Hentzen KG. Apparatus for micro-finish machining of compound, circular arc-shaped profiled surfaces in annular workpieces. 3,959,928, Cl. 51-58.000.

Schmitz, Reinold: *See*—
Linhart, Karl; and Schmitz, Reinold, 3,960,903.

Schmitzer, Willi, to Bayer Aktiengesellschaft. Apparatus for producing homogeneous materials or foam from at least two inter-reacting components. 3,960,506, Cl. 23-285.000.

Schmutzer, Joel J.: *See*—
Perry, John T.; and Schmutzer, Joel J., 3,961,173.

Schneider, Gerda: *See*—
Hollinger, Roderich; Wendtlandt, Wolf; and Schneider, Gerda, 3,960,960.

Schneider, Hans-Dieter: *See*—
Temme, Helmut; Hageneier, Werner; and Schneider, Hans-Dieter, 3,960,265.

Schoenwald, Jeffrey Stuart: *See*—
Hartmann, Clinton S.; and Schoenwald, Jeffrey Stuart, 3,961,293.

Schonstedt, Erick O., to Schonstedt Instrument Company. Magnetic locator having improved sensors. 3,961,245, Cl. 324-43.00R.

Schonstedt Instrument Company: *See*—
Schonstedt, Erick O., 3,961,245.

Schreyer, Gerd: *See*—
Beschke, Helmut; Schaefer, Hans; Schreyer, Gerd; Schuler, Wilhelm Alfons; and Weigert, Wolfgang, 3,960,766.
Geiger, Friedhelm; Heimberger, Werner; Schreyer, Gerd; and Weigert, Wolfgang, 3,961,023.

Schroder, Eberhard: *See*—
Ahrens, Hanns; Rufer, Clemens; Biere, Helmut; Schroder, Eberhard; Losert, Wolfgang; Loge, Olaf; and Schillinger, Ekkehard, 3,960,949.

Schroeck, Calvin William, to Lubrizol Corporation, The. Preparation of esters of amidoalkanesulfonic acids. 3,960,918, Cl. 260-456.00A.

Schroeder, Guenter: *See*—
Gaenzler, Wolfgang; Kabs, Klaus; and Schroeder, Guenter, 3,960,934.

Schroeder, Karl-Heinz; and Tuemmel, Herbert, to Zeiss Ikon AG. Offset drive pin adaptors for film projectors, film spools, and 35mm to 16mm converters. 3,960,337, Cl. 242-68.300.

Schroeder, Kenneth K. Apparatus for cleaning bowling lanes. 3,960,454, Cl. 401-140.000.

Schroeder, Wilburn C. Hydrogenation of coal to produce coke, pitch and electrode carbon. 3,960,701, Cl. 208-8.000.

Schuhmacher, Werner; and Rothenstein, Karl-Heinz, to Robert Bosch G.m.b.H. Pressure regulating valve. 3,960,170, Cl. 137-491.000.

Schukina, Maria Nikolaevna, deceased: *See*—
Gortinskaya, Tatyana Vladimirovna; Mashkovsky, Mikhail Davidovich; Polezhaeva, Antonina Ivanovna; Nyrkova, Valentina Georgievna; Bondar, Larisa Nikolaevna; Litova, Galina Nikolaevna; Schukina, Maria Nikolaevna, deceased; and Preobrazhenskaya, Maria Nikolaevna, administrator, 3,961,058.

Schulenberg, John W., to Sterling Drug Inc. Substituted N-arylanilines. 3,960,886, Cl. 260-326.50L.

Schuler, Wilhelm Alfons: *See*—
Beschke, Helmut; Schaefer, Hans; Schreyer, Gerd; Schuler, Wilhelm Alfons; and Weigert, Wolfgang, 3,960,766.

Schultz, Frank H. Luminaire duration control. 3,961,180, Cl. 250-206.000.

Schultz, Roland P.: *See*—
Baur, Charles B.; and Schultz, Roland P., 3,960,181.

Schulz, David Arthur, to Union Carbide Corporation. Fuel cell electrode. 3,960,601, Cl. 136-120.0FC.

Schulz, Winfried, to Siemens Aktiengesellschaft. Inductive displacement transducer using a bridge circuit having a stable voltage phase in the diagonal of the bridge. 3,961,243, Cl. 324-34.00D.

Schulze, James L., Sr., to General Electric Company. Air conditioning system for a mobile home including an interlock. 3,959,985, Cl. 62-239.000.

Schurrer, Josef, to Maschinenfabrik Augsburg-Nurnberg AG. Device for photoelectric measurements of moving parts. 3,961,184, Cl. 250-231.00R.

Schwarb, Gustav: *See*—
Bourquin, Jean-Pierre; Schwarb, Gustav; and Waldvogel, Erwin, 3,960,894.

Schwarte, Jurgen: *See*—
Juntgen, Harald; Knoblauch, Karl; Gappa, Gunther; and Schwarte, Jurgen, 3,960,529.

Schwarz, Rudolf, to Staeubli, Ltd. Heddles for weaving machines having heddle frame bars for several heddles, which bars are moved by a shed-forming device. 3,960,182, Cl. 139-91.000.

Schwarzkopf Development Corporation: *See*—
Heitzinger, Friedrich; and Lechleitner, Wilhelm, 3,960,604.

Schweickart, Albert J.: *See*—
Bortak, John J.; Balko, Edward N.; Schweickart, Albert J.; and Collins, Stephen M., 3,960,699.

Schweizerische Isola-Werke: *See*—
Mosimann, Hans; Heim, Peter; and Borer, Charles, 3,960,799.

Schweppe, Joseph L.: *See*—
Ahlgren, Erick L.; McMorris, Arthur H.; Miille, Jerry L.; and Schweppe, Joseph L., 3,960,072.

Science-Union et Cie: *See*—
Malen, Charles; and Laubie, Michel, 3,960,891.

Scott, Charles R.: *See*—
Parks, Dewey P.; and Scott, Charles R., 3,960,650.

Scott, Elmira J. Utensil holder for stove. 3,960,134, Cl. 126-24.000.

Searle, Robert J. G.: *See*—
Davis, Royston H.; and Searle, Robert J. G., 3,961,070.

Sease, John D.: *See*—
Bradley, Ronnie A.; and Sease, John D., 3,960,994.

Secrist, John A., III; Barrio, Jorge R.; Leonard, Nelson J.; and Weber, Gregorio, to University of Illinois Foundaton. Fluorescent derivatives of adenine-containing compounds. 3,960,840, Cl. 260-211.50R.

Segrest, Steven F.; and Gardner, Josef M., to United States of America, Navy. Helmet exhaust valve. 3,960,171, Cl. 137-495.000.

Seidel, Karlheinz, to Maschinenfabrik Augsburg-Nurnberg AG. Device for precision measurement of internal diameters. 3,959,887, Cl. 33-178.00R.

Seidler-Gordon, Laura: *See*—
Reed, George T.; and Seidler-Gordon, Laura, 3,961,164.

Seifert, Peter, to Black Clawson Company, The. Defibering apparatus for paper making stock. 3,960,332, Cl. 241-46.060.

Seiscom Delta Inc.: *See*—
Anstey, Nigel A., 3,961,306.

Seiter, Hartmut, to Consortium fur Elecktrochemische Industrie GmbH. Process for preparing layers of silicon carbide on a silicon substrate. 3,960,619, Cl. 148-175.000.

Seki, Michiharu, to Hitachi, Ltd. Process for removing sulfur oxides and nitrogen oxides from flue gases using halogen-impregnated actuated carbon with simultaneous injection of ammonia. 3,961,020, Cl. 423-239.000.

Sekida, Minoru, to Minolta Camera Kabushiki Kaisha. Interchangeable objective lens diaphragm exposure control coupling mechanism. 3,961,347, Cl. 354-272.000.

Sekiyama, Kunihiko; Taga, Yasuyoshi; and Fujita, Shigemi, to Nippon Gohsei Kagaku Kabushiki Kaisha. Method for preparing sorbic acid. 3,960,939, Cl. 260-526.00N.

Selke, Winfried, to ERNO Raumfahrttechnik GmbH. Equipment for growing algae. 3,959,923, Cl. 47-1.400.

Sellers, Jerry W., to Rockwell International Corporation. Electrically powered grass trimmer. 3,959,879, Cl. 30-276.000.

Seltzer, Raymond; and Sherman, Paul D., to Ciba-Geigy Corporation. Novel polymers from s-triazine cyanamide compounds. 3,960,783, Cl. 260-2.00R.

Semenova, Zoya Grigorievna: *See*—
Fridlyander, Iosif Naumovich; Yatsenko, Konstantin Petrovich; Nekrasova, Galina Anatolievna; Gulin, Alexandr Nikolaevich; Semenova, Zoya Grigorievna; Sidorov, Nikolai Grigorievich; Morozov, Boris Sergeevich; Krichevsky, Efrem Julievich; Zakharova, Tatyana Alexandrovna; and Sarycheva, Raisa Grigorievna, 3,960,551.

Semerdjiev, Stefan Georgiev: *See*—
Balevski, Anguel Tonchev; Nikolov, Ivan Dimov; Antonov, Asparuh Mihailov; and Semerdjiev, Stefan Georgiev, 3,960,996.

Seneca, Harry: *See*—
Avakian, Souren; and Seneca, Harry, 3,960,658.

Senoo, Yoshio, to Tokico Ltd. Process for recovering chromic acid solution from a waste liquor containing chromic ions. 3,961,029, Cl. 423-54.000.

Serck Industries Limited: *See*—
Holmes, Robert Taylor, 3,961,010.

Sergeys, Francis John, to W. R. Grace & Co. Honeycomb structure for countercurrent gas flow. 3,960,510, Cl. 23-288.0FB.

Seris, Jean Louis: *See*—
Bourdeau, Jean Paul; Seris, Jean Louis; and Pornin, Rene, 3,960,666.

Sette, Paul R.: *See*—
Zucker, Fredric E.; Storace, Anthony; and Sette, Paul R., 3,960,227.

Seuret, Marcel: *See*—
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Seymour, Lonnie Ray: *See*—
Benno, Edward Leonard; Schlueter, David Frederick; and Seymour, Lonnie Ray, 3,959,949.

Shackleton, Frank; and Butler, Donald, to Lankro Chemicals Group Limited. Substituted chloroacylanilides. 3,960,948, Cl. 260-562.00B.

Shakiba, Hosein M.: *See*—
Straitz, John F., III; and Shakiba, Hosein M., 3,960,064.

Shapley, Bruce D., to K/Tronic Inc. Magnetic tape cassette hub with tape retention means. 3,960,338, Cl. 242-74.100.

Shaposhnikov, Anatoly Alexandrovich: *See*—
Butuzov, Vladimir Petrovich; Vatolkin, Evgeny Konstantinovich; Gordienko, Leonid Alexandrovich; Feldman, Ernst Borisovich; Khadzhi, Valentin Evstafievich; and Shaposhnikov, Anatoly Alexandrovich, 3,960,501.

Sharp, John Howard: *See*—
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Sharps Associates: *See*—
Harris, Louis Selig; Pars, Harry George; Razdan, Raj Kumar; and Sheehan, John Clark, 3,960,871.

Shatwell, John: *See*—
Billany, Michael Royston; Longworth, Arthur Raymond; and Shatwell, John, 3,960,745.

Shavel, John, Jr.: *See*—
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Shaw, Garrett D.: *See*—
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Shea, Yale R.; Thelen, Arthur B.; and Parsons, H. William, to INRYCO, Inc. Riveted cellular panel assembly. 3,959,943, Cl. 52-618.000.

Sheehan, John Clark: *See*—
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Shell, John W.: *See*—
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Shell Oil Company: *See*—
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Shepherd, William E.: *See*—
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Sherman, Paul D.: *See*—
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Sherwin-Williams Company, The: *See*—
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Shiba, Keisuke: *See*—
Okumura, Akio; Yokota, Yukio; Inouye, Kozo; Shiba, Keisuke; and Yamada, Minoru, 3,960,571.

Shibuya, Yuzo: *See*—
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Shiga, Akinobu; Fukui, Yoshiharu; Matsumura, Kazuhiro; and Uchida, Satoru, to Sumitomo Chemical Company, Limited. Catalyst for polymerization of olefins and process for preparing the same. 3,960,765, Cl. 252-429.00B.

Shigita, Syozo: *See*—
Ueno, Eichiro; Kawasaki, Hideo; and Shigita, Syozo, 3,959,836.

Shiguma, Heijiro; and Suzuki, Shigekazu, to NHK Spring Co., Ltd. Grinding machine for coil springs. 3,959,931, Cl. 51-112.000.

Shima, Takeo: *See*—
Kuratsuji, Takatoshi; Kawase, Shoji; Shima, Takeo; Shimotsuma, Sakae; and Hosoi, Masahiro, 3,961,008.

Shimotsuma, Sakae: *See*—
Kuratsuji, Takatoshi; Kawase, Shoji; Shima, Takeo; Shimotsuma, Sakae; and Hosoi, Masahiro, 3,961,008.

Shinoda, Kazuo, to Toyota Jidosha Kogyo Kabushiki Kaisha. Pressure regulator of liquefied-gas fuel system for internal combustion engines. 3,960,126, Cl. 123-120.000.

Shio, Cheng. Electromagnetic vehicle. 3,960,229, Cl. 180-1.0VS.

Shneider, Aaron H. Protectors for rotary display stands. 3,959,903, Cl. 40-68.600.

Shono, Tetsuji, to Asahi Kogaku Kogyo Kabushiki Kaisha. Method and arrangement for manual stop-down mirror-ups of single lens reflex camera. 3,961,343, Cl. 354-156.000.

Shore, Jack H.: *See*—
Elliott, Stanley E.; and Shore, Jack H., 3,960,142.

Shu, John T.: *See*—
Bare, Thomas M.; and Shu, John T., 3,960,892.

Shubkin, Ronald L., to Ethyl Corporation. Process for replacing the hydroxy group of an aromatic hydroxy compound with an amine group. 3,960,962, Cl. 260-581.000.

Shugart Associates: *See*—
Chou, Albert S., 3,960,074.

Shuler, James R., to Caterpillar Tractor Co. Wear-compensating replacement sprocket. 3,960,412, Cl. 305-57.000.

Shull, William A., to Liconix. Process for manufacturing a helium metal vapor laser tube. 3,960,422, Cl. 316-19.000.

Shuttleworth, Henry, to Texaco Trinidad, Inc. Extraction of sulfuric acid from sulfuric acid-sulfonic acid mixtures. 3,960,938, Cl. 260-504.00S.

Shy, James L.; and Bliemeister, Robert M., to Allis-Chalmers Corporation. Method and apparatus for adjustably feeding raw material to a preheater for a kiln. 3,959,890, Cl. 34-10.000.

Sid Harvey, Inc.: *See—*
Lindtveit, Herbert E., 3,960,469.

Sidorov, Nikolai Grigorievich: *See—*
Fridlyander, Iosif Naumovich; Yatsenko, Konstantin Petrovich; Nekrasova, Galina Anatolievna; Gulin, Alexandr Nikolaevich; Semenova, Zoya Grigorievna; Sidorov, Nikolai Grigorievich; Morozov, Boris Sergeevich; Krichevsky, Efrem Julievich; Zakharova, Tatyana Alexandrovna; and Sarycheva, Raisa Grigorievna, 3,960,551.

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Leowald, Karl-Friedrich; and Schenk, Jakob, 3,961,204.
Schulz, Winfried, 3,961,243.

Siemes, Franz; Kraus, Andreas; and Buhl, Joachim, to Blech- und Metallwarenfabrik Robert Fischbach KG. Roof fan. 3,960,063, Cl. 98-43.00R.

Sigg, Hans, to Maag Gear-Wheel & Machine Company Limited. Positive engagement clutch. 3,960,253, Cl. 192-67.00A.

Sigg, Theodore William. Educational gaming apparatus. 3,959,893, Cl. 35-31.00G.

Sigma Diesel: *See—*
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Silar Laboratories, Inc.: *See—*
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Silec-Semi-Conducteurs, Societe Anonyme: *See—*
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Silvers, Charles. Precision cut-off weighing apparatus. 3,960,224, Cl. 177-47.000.

Silvia, Denis A.: *See—*
Abernathy, David D.; Adams, Herbert D.; Gilbertson, Warren L.; Leonard, Isaac E., III; and Silvia, Denis A., 3,960,085.

Simikoski, Wayne L. Corner protector. 3,960,354, Cl. 248-345.100.

Simjian, Luther G. Exercise and massaging apparatus. 3,960,144, Cl. 128-58.000.

Simmons, Pansy. Hair weaving tension system. 3,960,158, Cl. 132-56.000.

Simon, Karl-Heinz; and Weinheimer, Hans-Richard, to Zeiss-Stiftung, Carl. Tracking and display apparatus for heat-detecting systems. 3,961,194, Cl. 250-334.000.

Simpson, Robert Scott, to Reichhold Chemicals, Inc. Heat insulating assembly and method for making same. 3,960,625, Cl. 156-79.000.

Sinclair, Carter: *See—*
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Singer Company, The: *See—*
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Siwek, Andrzej Witold: *See—*
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Sklarchuk, Jack C.: *See—*
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Slack, Albert L.: *See—*
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Slack, Keith K.: *See—*
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Slack, Keith M.: *See—*
Bodner, Ronald E.; Crooks, Thomas L.; Magrisso, Israel B.; Slack, Keith M.; and Smith, Richard S., 3,961,313.

Slater, Billy Ray, to Forney Engineering Company. Combustion optimizer. 3,960,320, Cl. 236-15.00B.

Sleeper, David P., to Ecology Controls, Inc. Sound reducing enclosing. 3,960,237, Cl. 181-33.00K.

Sloan Valve Company: *See—*
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Slobodzian, Gregory E.: *See—*
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Sloevsky, Fedor Ignatievich; Orlov, Naum Yakovlevich; Gavrish, Petr Dmitrievich; and Rashesky, Anatoly Nikolaevich. Down-the-hole device for breaking rock, concrete and reinforced concrete by pulsewize high liquid pressure. 3,960,082, Cl. 102-22.000.

Smit, Hendrik: *See—*
Bos, Karel; and Smit, Hendrik, 3,959,970.

Smith, David M.; and Mennen, Frederick C. Self cleaning rotary lawn mower blade and deck assembly. 3,959,955, Cl. 56-17.500.

Smith, Elmer O.; and Weinstein, Samuel, to TRW Inc. Machine for fabricating a wire network. 3,961,153, Cl. 219-56.000.

Smith, Harold Vernon, deceased (by Smith, Jean E., administrator), to Pennwalt Corporation. Method of increasing corrosion resistance of anodized aluminum. 3,961,111, Cl. 427-419.000.

Smith, Inja: *See—*
Kydonieus, Agis F.; and Smith, Inja, 3,961,117.

Smith, James D. B.; and Kauffman, Robert N., to Westinghouse Electric Corporation. Flexible nontacky prepreg for bonding coils in high voltage devices and method of making said prepreg. 3,960,803, Cl. 260-37.0EP.

Smith, Jean E., administrator: *See—*
Smith, Harold Vernon, deceased, 3,961,111.

Smith, John Gerald, to Eaton Yale Ltd. Method and apparatus for harvesting sheared trees. 3,960,190, Cl. 144-3.00D.

Smith, John H.; and Rogers, George S., to United States of America, Navy. Reinforcement of cast or pressed explosives. 3,960,049, Cl. 86-20.00B.

Smith, Leonard W., to Standard Products Company, The. Weather strip with insertable cover strip. 3,959,941, Cl. 52-400.000.

Smith, Matthew S.; and Filippi, Ernest A. Weapon arrangement. 3,960,052, Cl. 89-37.0BA.

Smith, Richard S.: *See—*
Bodner, Ronald E.; Crooks, Thomas L.; Magrisso, Israel B.; Slack, Keith M.; and Smith, Richard S., 3,961,313.

Smith, Robert D., to Alco Standard Corporation. Non-destructive test apparatus and method for a material having a cavity therein. 3,960,006, Cl. 73-67.80S.

Smith, Roy E.: *See—*
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Smith, William E., to General Electric Company. Process for preparing allylic alcohols. 3,960,971, Cl. 260-638.00R.

SmithKline Corporation: *See—*
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Blackburn, Dale W.; and Caldwell, Henry Cecil, 3,960,870.
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De Marinis, Robert M.; and Hoover, John R. E., 3,960,855.
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Snam Progetti S.p.A.: *See—*
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Snarey, Michael: *See—*
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Snethen, Thomas J., to International Business Machines Corporation. Logic network test system with simulator oriented fault test generator. 3,961,250, Cl. 324-73.00R.

Snyder, Larry D.: *See—*
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Snyder, Robert H., to Uniroyal Inc. Steel-belted radial ply tires with 0° textile cap band. 3,960,628, Cl. 156-123.000.

Snyder, Solomon H., to Nelson Research & Development Company. Antidepressant. 3,961,073, Cl. 424-325.000.

Snyder, Travis C.: *See—*
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Societa' Italiana Resine S.I.R. S.p.A.: *See—*
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Societa Italiana Telecomunicazioni Siemens S.p.A.: *See—*
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Societa' Nebiolo S.p.A.: *See—*
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Societe Anonyme des Usines Chausson: *See—*
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Societe Anonyme Roure-Bertrand-Dupont: *See—*
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Societe D'Assistance Technique pour Produits: *See—*
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Societe de Vente de l'Aluminium Pechiney: *See—*
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Societe Nationale des Petroles d'Aquitaine: *See—*
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Dailey, Lawrence W., 3,961,015.

Soes, Lucas, to AMP Incorporated. Electrical connector assembly. 3,960,434, Cl. 339-176.00M.

Solartron Electronic Group Limited, The: *See—*
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Solco Basel AG: *See—*
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Sommer, Warren T. Stirring mechanism. 3,960,369, Cl. 259-111.000.

Songer, Hubert D., to Perfect Equipment Corporation. Wheel balancing weight. 3,960,409, Cl. 301-5.00B.

Sonnino, Mario, to American Cyanamid Company. Winding suture reel-labels. 3,959,947, Cl. 53-21.0FW.

Sony Corporation: *See—*
Kono, Osamu; Tsuchiya, Noboru; Matsuda, Atsushi; and Yoshida, Kiichi, 3,961,202.
Murata, Nobuyuki; and Saito, Makoto, 3,961,374.

Sorensen, Leif Brunswig, to Horsens Plastic A/S. Method of manufacturing biaxially stretched shrink foils and an apparatus for carrying the method into effect. 3,960,997, Cl. 264-40.000.
Southwire Company: *See—*
Chia, E. Henry; and Chadwick, Kenneth E., 3,960,606.
Sowell, John B.: *See—*
Genevitz, Roberta L.; Genevitz, Joseph R.; and Sowell, John B., 3,961,112.
SPA-Societa Prodotti Antibiotici S.p.A.: *See—*
Bruzzese, Tiberio; and Ghielmetti, Giuseppe, 3,961,047.
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Space Sciences, Inc.: *See—*
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Spacie, Roy W.: *See—*
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Spadaro, James J.: *See—*
Lambou, Madeline G.; Spadaro, James J.; and Rusch, Eunice M., 3,960,763.
Sparks, Bryan D., to Canadian Patents and Development Limited. Spherical agglomeration of ilmenite. 3,961,005, Cl. 264-117.000.
Speraw, Floyd G.; Hess, Thomas M.; and Sampson, Harold J., to NCR Corporation. Checkout system. 3,960,420, Cl. 312-140.100.
Sperry Rand Corporation: *See—*
Garrott, William L., 3,959,953.
Halls, Lawrence M., 3,959,957.
Spicer, William E., to Varian Associates. Pick up screens for X-ray image intensifier tubes employing evaporated activated scintillator layer. 3,961,182, Cl. 250-213.0VT.
Spiewak, John W., to Firestone Tire & Rubber Company, The. Ordered aromatic copolyamide urea polymer. 3,960,818, Cl. 260-77.50C.
Spincic, Johann: *See—*
Broemer, Heinz; Meinert, Norbert; and Spincic, Johann, 3,960,579.
Splitt, Frank G., to Cook Electric Company. Two pair station protector. 3,961,229, Cl. 317-120.000.
Spodig, Heinrich. Magnetic separator. 3,960,716, Cl. 209-220.000.
Spooner, Ronald E.; and Downing, Terry R., to Allis-Chalmers Corporation. Automatic overload control for a counterbalanced lift truck. 3,960,286, Cl. 214-674.000.
Spunt, Leonard. Modular dome structure. 3,959,937, Cl. 52-81.000.
Square D Company: *See—*
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SSP Products, Inc.: *See—*
Thompson, Harold R.; and Anderson, Ralph A., 3,960,343.
Staal, Gerardus B.: *See—*
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Staats, James E., to General Electric Company. Magnetron power supply and control circuit. 3,961,152, Cl. 219-10.55B.
Stables, Harry Carson: *See—*
Long, Alan Gibson; Walker, Derek; Eastlick, David Thomas; and Stables, Harry Carson, 3,960,843.
Stach, Leonard J., to Velsicol Chemical Corporation. Insecticidal compositions and methods of killing insects using benzylthiomethylenephosphonamidates and phosphoramidates. 3,961,050, Cl. 424-216.000.
Staeubli, Ltd.: *See—*
Schwarz, Rudolf, 3,960,182.
Stahlecker, Fritz, to Stahlecker, Fritz; and Stahlecker, Hans. Apparatus for removing impurities from fibrous material. 3,959,961, Cl. 57-56.000.
Stahlecker, Hans: *See—*
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Stamicarbon B.V.: *See—*
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Standard Oil Company: *See—*
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McCollum, John D.; and Quick, Leonard M., 3,960,706.
McCollum, John D.; and Quick, Leonard M., 3,960,708.
Puskas, Imre; and Cengel, John A., 3,960,900.
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Stapp, Paul R., to Phillips Petroleum Company. Alkenol production. 3,960,972, Cl. 260-638.00R.
Stapp, Paul R., to Phillips Petroleum Company. Alkenol production. 3,960,973, Cl. 260-638.00R.
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Stauffer Chemical Company: *See—*
Baker, Don R.; Walker, Francis H.; and Letchworth, Peter E., 3,960,922.
Gillespie, Robert A., 3,961,231.
Gutman, Arnold D., 3,960,951.
Mickley, Harold S., 3,961,035.
Pallos, Ferenc M., 3,960,917.
Stayner, Robert A., to Chevron Research Company. Wax-flux composition containing amine salts of carboxylic acids for soldering. 3,960,613, Cl. 148-23.000.
Stayner, Robert A., to Chevron Research Company. Wax-flux composition containing a diester of sulfomaleic acid for soldering. 3,960,614, Cl. 148-23.000.
Steele, Everett T., Jr., to Robertshaw Controls Company. Temperature responsive valve. 3,960,321, Cl. 236-100.000.
Steidley, Roy B.: *See—*
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Stein, Joseph A., Jr.; and Wettering, Carl A., to Batesville Casket Company. Casket cap brace. 3,959,859, Cl. 27-18.000.
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Steinbrecher, Lester; and Hall, Wilbur S., to Amchem Products, Inc. Process for coating metals. 3,960,610, Cl. 148-6.14R.
Steinke, Leo: *See—*
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Stendel, Wilhelm: *See—*
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Stephens, James B.; and Anderson, Frank R., to Westates Space-Era Products, Inc. Liquid measuring devices. 3,960,297, Cl. 222-449.000.
Stephens, Milton L., to Textron, Inc. Quick opening device for a slide fastener. 3,959,857, Cl. 24-205.00R.
Sterling Drug Inc.: *See—*
Lesher, George Y.; Gelotte, Karl O.; and Surrey, Alexander R., 3,960,945.
Schulenberg, John W., 3,960,886.
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Mayr, Hubert; Presoly, Elfriede; Weinrotter, Ferdinand; Muller, Walter; Stern, Gerhard; and Frohner, Walter Mizzi, deceased, 3,960,541.
Sternheimer, Richard. Urinary sediment stain. 3,961,039, Cl. 424-3.000.
Stevenson, Clarence H., III. Programmable digital/analog memory system. 3,961,163, Cl. 235-61.11A.
Stevko, Phillip J., Jr., to Addressograph Multigraph Corporation. Electrostatic toner transfer. 3,960,109, Cl. 118-637.000.
Stewart-Warner Corporation: *See—*
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Stier, Otto, to Vollmer Werke Maschinenfabrik GmbH. Machine for treating teeth of saw blades. 3,960,037, Cl. 76-43.000.
Stierli, Robert F.; Tarver, Clayton C.; and Gaidis, James M., to W. R. Grace & Co. Magnesium phosphate concrete compositions. 3,960,580, Cl. 106-58.000.
Stingl, Helmut, to Hoechst Aktiengesellschaft. Fungicidal compositions. 3,961,052, Cl. 424-200.000.
Stirling, Walter Robert, to Ferodo Limited. Vehicle retarders. 3,960,249, Cl. 188-264.00F.
Stitt, Paul A. Soluble waste conversion process and pasteurized proteinaceous products. 3,961,078, Cl. 426-41.000.
Stobart, Charles R., to E-Systems, Inc. Vehicle locating apparatus. 3,961,166, Cl. 235-150.270.
Stock, Heinz; and Rebentisch, Hans W., deceased (by Rebentisch, Waltraud, heir at law), to USM Corporation. Method and device for metering and dispersing fluid materials. 3,960,187, Cl. 141-1.00R.
Stock, Rolf: *See—*
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Sax, Alan M.; and Stolkin, Walter J., 3,960,313.
Stolzer, Paul, to Keuro Maschinenbau Gesellschaft mit beschrankter Haftung & Co. Kommanditgesellschaft. Storage system. 3,960,280, Cl. 214-8.50A.
Stoner, William W.; Wilson, David T.; and Barrett, Harrison H., to Raytheon Company. Coded imaging systems. 3,961,191, Cl. 250-312.000.
Stoppacher, Waldemar, to Interoptic Laboratories, Inc. Abrasive pad for grinding lenses. 3,959,935, Cl. 51-395.000.
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Story, Paul Richard; Busch, Peter; Denson, Donald Derby; and Wright, Carl Edward, to Research Corporation. Method for the preparation of macrocyclic compound. 3,960,897, Cl. 260-343.000.
Story, Wayne G. Automatic quilting machine. 3,960,095, Cl. 112-118.000.
Strader, Don S.; Masser, Lloyd G.; and Lundwall, Robert J., to Lear Siegler, Inc. Vehicle suspension system and alignment mechanism therefor. 3,960,388, Cl. 280-693.000.
Straitz, John F., III; and Shakiba, Hosein M., to National Airoil Burner Company, Inc. Tall stack construction. 3,960,064, Cl. 98-60.000.
Strauss, Werner, to Klockner-Humboldt-Deutz Aktiengesellschaft. Centrifugal separator with rotary distributor. 3,960,714, Cl. 209-139.00A.
Striegler, John Howard; and Howell, Eddie Paul, to Atlantic Richfield Company. Production of bitumen by steam injection. 3,960,213, Cl. 166-272.000.
Striegler, John Howard; and Howell, Eddie Paul, to Atlantic Richfield Company. Recovery of bitumen by steam injection. 3,960,214, Cl. 166-272.000.
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Payet, George Louis, 3,960,483.
Stritzke, Gerd O. Attachment for kites and the like. 3,960,347, Cl. 244-155.00R.
Stritzko, Vilem, to Bleiche A.G. Liquid-treating of filamentary materials. 3,960,487, Cl. 8-155.100.
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Structural Plastics Incorporated: *See—*
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Sudduth, Jerome R.; and Keyworth, Donald A., to Tenneco Chemicals, Inc. Process for the purification of gas streams. 3,960,910, Cl. 260-438.100.
Sueyoshi, Tohru; Nakazawa, Yoshiyuki; Nakamura, Yoshuhara; Ohi, Reiichi; and Kondo, Tokiharu, to Fuji Photo Film Co., Ltd. Photographic material containing fine silver halide particles and hydroxylamino substituted triazine or pyrimidine sensitizers. 3,960,568, Cl. 96-76.00R.
Suggitt, Robert M.; Gates, Walter C., Jr.; and Hudson, Ralph B., Jr., to Texaco Inc. Hydrocarbon upgrading process. 3,960,964, Cl. 260-583.00M.
Sugimoto, Hiroshi; Takeuchi, Hiroyuki; and Yokotsuka, Tamotsu, to Kikkoman Shoyu Co., Ltd. Process for autolysis of yeast. 3,961,080, Cl. 426-60.000.
Sugimura, Yukio: *See—*
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Sullivan, Edward A., to Ventron Corporation. Wood pulp bleaching composition containing sodium hydrosulfite and hexamethylenetetramine. 3,960,649, Cl. 162-72.000.
Suminokura, Toshihiko; Kyogoku, Yojuro; and Yasumoto, Noboru, to Kurashiki Boseki Kabushiki Kaisha. Temporary interlining coated with foamed adhesive. 3,961,125, Cl. 428-261.000.
Sumitomo Chemical Company, Limited: *See—*
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Maruyama, Isamu; Yamamoto, Hisao; Nakao, Masaru; Sakai, Shigeru; Sasajima, Kikuo; Kitagawa, Sumio; and Inaba, Shigeho, 3,960,873.
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Suschitzky, John Louis; and Rutherford, David, to Frisons Limited. Ferrocene compounds and preparation. 3,960,911, Cl. 260-439.0CY.
Suzuki, Gyoji; Nagata, Masayoshi; Tomotsu, Takeshi; and Ono, Hisatake, to Fuji Photo Film Co., Ltd. Method of making a semiconductor device utilizing a light-sensitive etching agent. 3,960,559, Cl. 96-36.000.
Suzuki, Hideo, to Mitsui Shipbuilding & Engineering Co., Ltd. Ships for transporting iron ore pellets. 3,960,101, Cl. 114-73.000.
Suzuki, Katsunori: *See—*
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Suzuki, Kooji, to Dai Nippon Insatsu Kabushiki Kaisha. Display apparatus. 3,959,902, Cl. 40-28.00R.
Suzuki, Shigekazu: *See—*
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Suzuki, Shuei: *See—*
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Suzuki, Yoshiaki; Mori, Hajime; and Nakanome, Takemi, to Mitsubishi Chemical Industries Ltd. Method for the separation of hydrocarbons. 3,960,976, Cl. 260-674.00R.
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Svahn, B. Knut Lennart; and Wersen, Lars Gustav Vilhelm, to J. Mustad AB. Stretching screw. 3,960,359, Cl. 254-67.000.
Svensson, Sven Torsten Arnold; and Bjelvert, Sven William, to Forenade Fabriksverken. Electronic telescopic sight. 3,960,453, Cl. 356-252.000.
Swarsbrick, Douglas Edward: *See—*
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Sweet, John R., II; and Chan, Kingsley, to Acurex Corporation. Centrifugal arranging and feeding apparatus. 3,960,293, Cl. 221-258.000.
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Swensen, Eugene T. Ultrasonic standing wave sensor. 3,960,007, Cl. 73-67.80R.
Swiss Aluminium Ltd.: *See—*
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SWS Silicones Corporation: *See—*
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Symmons, Paul C., to Symmons Industries, Inc. Water mixing valve with temperature indicator. 3,960,016, Cl. 73-343.00R.
Syncro-Motion Corporation: *See—*
Mort, Paul R., Jr.; and Cleary, Robert A., 3,960,640.
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Tabuchi, Muneharu; Bando, Shosen; Tabei, Tadashi; and Asai, Yasuhiro, to Toray Industries, Inc. Heating roller apparatus with precise temperature measurement. 3,961,158, Cl. 219-471.000.
Tachibana, Kan-ichi; Nishioka, Michihiro; Uchida, Akio; and Ono, Mikiya, to Mitsubishi Mining & Cement Company, Ltd. Surge absorber. 3,961,225, Cl. 317-61.000.
Tacker, John J.: *See—*
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Talan, Maryan. Fastening peg and method of making same. 3,959,853, Cl. 24-73.0PF.
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Tamura, Masaki; Ushiro, Soichiro; and Hasagawa, Shiro, to CPC International Inc. Process for the continuous isomerization of dextrose. 3,960,663, Cl. 195-31.00F.
Tanabe, Yoshio: *See—*
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Tanaka, Akio, to Zenith Radio Corporation. Channel seeking tuning system. 3,961,266, Cl. 325-452.000.

Tanaka, Chiaki: *See—*
Yoda, Naoya; Yoshi-i, Toshiya; Fujita, Saburo; Mochizuki, Hiroshi; Yumoto, Hirosuke; Kurihara, Masaru; Kubota, Takashi; Dokoshi, Noriaki; and Tanaka, Chiaki, 3,961,009.

Tanaka, Hiromichi, to Matsushita Electric Industrial Co., Ltd. Color television camera. 3,961,364, Cl. 358-46.000.

Tanaka, Hiroshi; Tanaka, Takuo; and Tanaka, Takeshi, to Japan Synthetic Rubber Co., Ltd. Composite adsorbent. 3,960,771, Cl. 252-446.000.

Tanaka, Takeshi: *See—*
Tanaka, Hiroshi; Tanaka, Takuo; and Tanaka, Takeshi, 3,960,771.

Tanaka, Takuo: *See—*
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Tanner, John Ernest. Internal cylindrical bearing surfaces. 3,961,104, Cl. 427-198.000.

Tantram, Anthony Desmond Shand. Detection of combustible gases. 3,960,495, Cl. 23-232.00E.

Tarax Pty. Limited: *See—*
Lewis, Peter Sydney; and Lohning, Franklin Marius, 3,961,150.

Tardoskegyi, Louis V., to Electrovert Ltd. Shock-resisting hanger systems and suspended assemblies. 3,960,350, Cl. 248-54.00R.

Tarver, Clayton C.: *See—*
Stierli, Robert F.; Tarver, Clayton C.; and Gaidis, James M., 3,960,580.

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Taylor, Byron Kent, to RCA Corporation. Disc record locked groove escape apparatus. 3,961,131, Cl. 178-6.60R.

Taylor, Edward J. Douche-enema pump. 3,960,466, Cl. 417-234.000.

Taylor, Lynn Johnston. Direct synthesis of organic polymer-inorganic oxide composites. 3,960,805, Cl. 260-37.00N.

Technical Hardware, Inc.: *See—*
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Technicon Instruments Corporation: *See—*
Gordon, Abraham; and Adler, Stanford L., 3,960,020.

Tee-pak, Inc.: *See—*
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Teijin Limited: *See—*
Kuratsuji, Takatoshi; Kawase, Shoji; Shima, Takeo; Shimotsuma, Sakae; and Hosoi, Masahiro, 3,961,008.

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Tell, Peter Hans, to Aktiebolaget Piab. Method for producing an ejector device. 3,959,864, Cl. 29-156.40R.

Temme, Helmut; Hageneier, Werner; and Schneider, Hans-Dieter, to Gewerkschaft Eisenhutte Westfalia. Mining installations. 3,960,265, Cl. 198-204.000.

Teng, James; and Stubits, Marcella C., to Anheuser-Busch, Incorporated. Synergistic organic solvent gellant. 3,960,514, Cl. 44-7.00B.

Tengbergen, Erik Adriaan Willem Van Ebbenhorst: *See—*
La Roy, Dick; and Tengbergen, Erik Adriaan Willem Van Ebbenhorst, 3,960,635.

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Terada, Masaaki, to Olympus Optical Co., Ltd. Endoscope with a tube for a medical treating instrument. 3,960,143, Cl. 128-4.000.

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Tesberg, Allan V., to Lawrence Peska Associates, Inc., a part interest. Dental floss holder and applicator. 3,960,159, Cl. 132-90.000.

Texaco Inc.: *See—*
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Duranleau, Roger G.; and Larkin, John M., 3,960,953.
Kuntschik, Lawrence F.; and Rigdon, Orville W., 3,960,955.
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Textron, Inc.: *See—*
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Thatcher, Arthur K. Apparatus for mounting tape containing recorded information. 3,959,905, Cl. 40-124.000.

Theisen, Dieter: *See—*
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Thelen, Adam, to Plastic-Fabrik Elbenia GmbH & Co., Inc. Spool core for the wet treatment of threads and yarns. 3,960,341, Cl. 242-118.100.

Thelen, Arthur B.: *See—*
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Thelen, Edmund: *See—*
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Thermanil Chemical Company, Incorporated: *See—*
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Thiokol Corporation: *See—*
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Thirion, Andre, to Antivols Simplex S.A. Anti-theft device for automobile vehicles. 3,959,996, Cl. 70-186.000.

Thom, Kenneth C.: *See—*
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Thomas, David W.: *See—*
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Thomas, Gordon D., to Kimberly-Clark Corporation. Embossed paper toweling and method of production. 3,961,119, Cl. 428-178.000.

Thomas, Ieuan: *See—*
Jones, Eileen; Morris, Arthur; Thomas, Ieuan; and Traynor, James Rodney, 3,960,819.

Thomas, Luther B. Internal combustion engine. 3,959,974, Cl. 60-712.000.

Thomas, Samuel M. Method and apparatus for determining a measured direction relative to an external magnetic direction. 3,959,889, Cl. 33-361.000.

Thompson, Harold R.; and Anderson, Ralph A., to SSP Products, Inc. Double wall ducting. 3,960,343, Cl. 244-1.00R.

Thompson, Russell L. Quick hair end wrap for permanent wave. 3,960,156, Cl. 132-31.00R.

Thompson, Thomas D.; and Bradshaw, Robert W., to Yara Engineering Corporation. Reinforcing pigments. 3,960,588, Cl. 106-288.00Q.

Thyssens, Guido Maria Josepha Benedikt, to International Standard Electric Corporation. Multi-frequency signalling system. 3,961,143, Cl. 179-84.0VF.

Tiefert, Karl H., to Hewlett-Packard Company. Method and chip configuration of high temperature pressure contact packaging of Schottky barrier diodes. 3,961,350, Cl. 357-15.000.

Tiger, Emil, to Bell & Howell Company. Microfiche reader-printer. 3,960,042, Cl. 83-583.000.

Tiller, Boyce C. Bird feeder. 3,960,112, Cl. 119-51.00R.

Timson, William J., to Polaroid Corporation. Polydispersed silver halide emulsions with iodide for use in diffusion transfer. 3,960,557, Cl. 96-3.000.

Titanium Technology N.V.: *See—*
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Tittmann, Egon; and Walter, Heinz, to Robert Bosch G.m.b.H. Apparatus for regulating the pressure and rate of flow of fluid supplied by a variable-delivery pump. 3,959,969, Cl. 60-445.000.

Titus, Donald E.; and Tsao, Sherman H. M., to International Business Machines Corporation. Method for generation of multiple uniform fluid filaments. 3,960,324, Cl. 239-4.000.

Toda, Soichiro: *See—*
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Tokai TRW & Co. Limited: *See—*
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Toki, Kuni, to Kett Electric Laboratory. Linear output moisture meter with temperature compensator. 3,961,247, Cl. 324-65.00R.

Tokico Ltd.: *See—*
Senoo, Yoshio, 3,961,029.

Tomikawa, Masami; Tsunoda, Akiji; Kaneda, Kazuhisa; Ohkawa, Hideo; and Mugino, Yutaka, to Idemitsu, Kosan Kabushiki Kaisha (Idemitsu Kosan Co., Ltd.). Oil adsorbent. 3,960,722, Cl. 210-36.000.

Tomotsu, Takeshi: *See—*
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Toray Industries, Inc.: *See—*
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Touw, Theodore R.: *See—*
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Townsend, Leroy B.; Earl, Robert A.; and Manning, Steven J., to University of Utah, The. Method of synthesizing 1-(tetrahydro-2-furanyl)-5-fluorouracil. 3,960,864, Cl. 260-260.000.

Toyama, Kozo: *See—*
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Toyo Jozo Co., Ltd.: *See—*
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Toyo Jozo Kabushiki Kaisha: *See—*
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Tresjo, Paul Einar: *See—*
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Treuner, Uwe D.; and Breuer, Hermann, to E. R. Squibb & Sons, Inc. 3-Heterothio derivatives of [(alkoxycarbonyl)oxyacetyl]cephalosporins. 3,960,850, Cl. 260-243.00C.

Tribe, Leonard T., to Kelsey-Hayes Company. Speed sensing device. 3,960,248, Cl. 188-181.00R.

Trueb, Victor, to Heinz Hermann Weick. Wall-mounted laundry driers. 3,960,274, Cl. 211-1.300.

Truett, William Lawrence, to PPG Industries, Inc. Antifreeze composition. 3,960,740, Cl. 252-73.000.

Trumpp, Alfred: *See—*
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Trush, Victor, to Sanders Associates, Inc. Frequency memory apparatus. 3,961,273, Cl. 328-155.000.

TRW Inc.: *See—*
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Tschentscher, Alfred, to FMN Schuster & Co. Apparatus for forming a waste winding adjacent a reserve winding when winding a thread onto a spool. 3,960,336, Cl. 242-18.0PW.

Tselik, Ivan Nikiforovich: *See—*
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Tsuchiya, Noboru: *See—*
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Tsujikawa, Masahiro; Ozasa, Minoru; Takagi, Fumio; Hirai, Katsumi; Iwasaki, Akio; Imamura, Hiroshi; and Ueda, Testuhiro, to Matsushita Electric Industrial Co., Ltd. Apparatus for removing nitrogen oxides from a contaminated gas containing the same. 3,960,507, Cl. 23-288.00K.

Tsujimoto, Michihiro; Nishizawa, Tsutomu; and Okubo, Ichiro, to Mitsui Toatsu Chemicals, Incorporated. Coloring of organic materials with asymmetric thioindigoid compounds. 3,960,479, Cl. 8-36.000.

Tsunoda, Akiji: *See—*
Tomikawa, Masami; Tsunoda, Akiji; Kaneda, Kazuhisa; Ohkawa, Hideo; and Mugino, Yutaka, 3,960,722.

Tuemmel, Herbert: *See—*
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Turbak, Albin F., to Tee-pak, Inc. Process for improving storage life of meat. 3,961,086, Cl. 426-240.000.

Turk, Chester Frank: *See—*
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Tyler, Hugh Jean, to Robertshaw Controls Company. Modulating electronic room thermostat. 3,961,237, Cl. 323-19.000.

Tylko, Jozef Kazimierz, to British Titan Limited. Process for the production of iron-containing titaniferous particles. 3,960,544, Cl. 75-3.000.

Uchida, Akio: *See—*
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Ueda, Hiroyuki; and Sawano, Yukio, to Fuji Photo Film Co., Ltd. System for preparing commutation ticket and the like. 3,961,161, Cl. 235-61.11F.

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Ueno, Eichiro; Kawasaki, Hideo; and Shigita, Syozo, to American Cyanamid Company. Printing process. 3,959,836, Cl. 8-21.00A.

Uenoyama Kiko Co., Ltd.: *See—*
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Ukita, Junichi, to New Registon Company, Limited, The. Resinoid wheel containing a mixture of trimanganese tetraoxide and ferroxide and ferric oxide fillers. 3,960,517, Cl. 51-298.00R.

Ullmann, Werner; Derighetti, Renato; and Gagliati, Umberto, to A.G. fur industrielle Elektronik AGIE Losone b. Locarno. Apparatus comprising a plurality of separate parts, and control apparatus for producing synchronizing control signals for said separate parts. 3,961,270, Cl. 328-75.000.

Umemoto, Sueo: *See—*
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Umezawa, Hamao; Takita, Tomohisa; Fujii, Akio; and Ito, Hiroko, to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai. Method for preparing 3-(methylmercaptol) propylaminobleomycin. 3,960,834, Cl. 260-210.0AB.

Underwriters Safety Device Company: *See—*
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Union Carbide Corporation: *See—*
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Union Kol-Flo Corporation: *See—*
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Van Dusen, Frederick E., to Van Dusen & Co., Inc. Support for silo unloader, silo safety platform, and silage distributor. 3,960,283, Cl. 214-17.0CB.
Van Tuyl, David H., to E. D. Bullard Company. Back-up alarm with improved keeper. 3,960,104, Cl. 116-60.000.
Van Wuytswinkel, Charles M. G., to Caterpillar Tractor Co. Motor disconnect means. 3,960,230, Cl. 180-9.620.
Vargiu, Silvio; Carpaneti, Edoardo; and Passalenti, Beppino, to Societa' Italiana Resine S.I.R. S.p.A. Mixtures of vinyl ester resins. 3,960,981, Cl. 260-837.00R.
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Vermeulen, Jacobus Cornelis; and Stuart, Eric Jan, to Hoogovens Ijmuiden, B.V. Method for cleaning gases and vapors. 3,961,032, Cl. 423-210.000.
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Villadsen, Karl Johan Stampe; and Vestberg, Karin Pinholt, to Villadsen, Karl Johan Stampe. Production of proteolytic enzymes. 3,960,665, Cl. 195-66.00R.

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Vives, Van C., to Phillips Petroleum Company. Dihalodicyano alkenes. 3,960,921, Cl. 260-464.000.

Vlasak, Robert, to Lennox Industries Inc. Motor protection apparatus using fusible links. 3,959,984, Cl. 62-229.000.

Vock, Manfred H.: *See*—
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Vogt, Herwart C.; Deck, Charles F.; and Davis, Pauls, to BASF Wyandotte Corporation. Chloronitrosylated, chlorosulfonated hydrocarbon polymers and a process for the preparation thereof. 3,960,821, Cl. 260-79.30A.

Vogt, Herwart C: *See*—
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Vollmer Werke Maschinenfabrik GmbH: *See*—
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Vorwerk & Co. Elektrowerke KG: *See*—
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Vreeland, Robert W., to University of California, The Regents of the. Transient-free isolation monitor. 3,961,224, Cl. 317-18.00R.

Vuaille, Andre, to Sigma Diesel. Device for regulating the delivery of a fuel injection pump of an internal combustion engine. 3,960,127, Cl. 123-140.0MP.

W. R. Grace & Co.: *See*—
Sergeys, Francis John, 3,960,510.
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Wagner, David Prugh, to Illinois Tool Works Inc. Fastener assembly for creating accurate tension indicating fastener and method of calibrating the same. 3,960,048, Cl. 85-62.000.

Wagner, Ernest W., to Caterpillar Tractor Co. Self-loading scraper with pivotal floor panel. 3,959,896, Cl. 37-8.000.

Waldvogel, Erwin: *See*—
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Walker, John: *See*—
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Walker, John A.; Dimitri, Dimitri S.; and Perkins, Reginald Louis, to Datametrics Corporation. Electrode print head. 3,961,336, Cl. 346-139.00C.

Walker, Ralph Lawrence; and Stockdale, John Richard, to Albright & Wilson Limited. Coating compositions with magnesium phosphate pigment. 3,960,611, Cl. 148-6.15R.

Wall, Albert. Hair styling device. 3,960,155, Cl. 132-9.000.

Wallace, Donald G.: *See*—
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Walls, Earl L.; and Olson, Verl O. Hand control system for power hand tools. 3,959,883, Cl. 32-27.000.

Wallsten, Hans Ivar, to AB Inventing. Means for expandable objects, preferably shock-absorbing protective means for passengers in vehicles. 3,960,386, Cl. 280-731.000.

Walter, Heinz: *See*—
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Wank, Joachim: *See*—
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Warren, Lyle D.; and Brewster, Robert W. Automatic sawmill. 3,960,041, Cl. 83-361.000.

Warsager, Rubin. Transfer tape for surface decorating an article. 3,961,121, Cl. 428-200.000.

Warwick Electronics Inc.: *See*—
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Wason, Satish K., to J. M. Huber Corporation. Amorphous precipitated siliceous pigments and improved process for producing such pigments. 3,960,586, Cl. 106-288.00B.

Wasserman, Noa: *See*—
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Watanabe, Satoshi, to Okaya Denki Sangyo Kabushiki Kaisha. Spacer for a discharge display device. 3,961,218, Cl. 313-220.000.

Waterman, Michael W.; and Foster, Samuel L., to Allis-Chalmers Corporation. Capacitance method of monitoring insulation dryness of an electrical induction apparatus. 3,961,246, Cl. 324-54.000.

Wavin B.V.: *See*—
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Weber, Claude J. Releasable non-slip attachment means for connecting fishing lines to down-rigger cables. 3,959,913, Cl. 43-43.120.

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Weiner, Philip D.; and Kermans, Jasper J., to E. Kahn's Sons Company, The. Method of preparing rare roast beef. 3,961,090, Cl. 426-281.000.

Weinheimer, Hans-Richard: *See*—
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Weinrotter, Ferdinand: *See*—
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Weisenburger, Lawrence Paul, to AMP Incorporated. Multi-contact connector for substrate-to-board connections. 3,960,423, Cl. 339-17.0CF.

Weisenburger, Lawrence Paul, to AMP Incorporated. Multi-contact spring connector for board to board connections. 3,960,424, Cl. 339-17.00M.

Weishaupt, Paul, to Wagner & Cie AG. Apparatus for exposing a light-sensitive layer. 3,961,366, Cl. 358-80.000.

Weiss, Leonard E.; and Hortin, Kenneth L., to Whirlpool Corporation. Method of making a liner construction. 3,960,631, Cl. 156-244.000.

Weissmueller, William R., Jr., to Warwick Electronics Inc. Channel selecting control system for television tuner including unused channel skip system. 3,961,267, Cl. 325-470.000.

Welding Controls Limited: *See—*
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Weldon, Lawrence A.; and Bokalo, Peter, to Gulton Industries, Inc. Thermal printing element arrays. 3,961,155, Cl. 219-216.000.

Wells, William R., to United Audio Visual Corporation. Method and apparatus for interrupting a device for a preselected interval of time. 3,961,162, Cl. 235-61.11E.

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Wendtlandt, Wolf: *See—*
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Wenner, John William, to International Business Machines Corporation. Rapid access storage device. 3,961,370, Cl. 360-93.000.

Wersen, Lars Gustav Vilhelm: *See—*
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Werth, John; Crouch, Dell A.; and Sklarchuk, Jack C., to ESB Incorporated. Method for fabricating electrochemical cells. 3,960,597, Cl. 136-6.0FS.

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Western Geophysical Company of America: *See—*
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Westguard Products, Inc.: *See—*
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Westinghouse Electric Corporation: *See—*
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Westvaco Corporation: *See—*
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Weyl, Helmut; and Ziegler, Bodo, to Robert Bosch G.m.b.H. Electrochemical sensor construction. 3,960,692, Cl. 204-195.00S.

Weyl, Helmut; and Steinke, Leo, to Robert Bosch GmbH. Device for electrochemically measuring the concentration of oxygen in combustion gases. 3,960,693, Cl. 204-195.00S.

Wheeler, Claude A., to Rockwell International Corporation. Weft yarn control device. 3,960,186, Cl. 139-450.000.

Wheeler, Phillip R.: *See—*
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Whitby, Clyde M.; and White, Douglas L., to Singer Company, The. Combined laser recording and color projection system. 3,961,334, Cl. 346-17.000.

White, Douglas L.: *See—*
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White, Fred K., to Miles Laboratories, Inc. Biological test apparatus. 3,960,499, Cl. 23-253.00R.

White, Fred K., to Miles Laboratories, Inc. Liquid inspection slide. 3,961,346, Cl. 356-244.000.

Whited, Charles A.: *See—*
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Whitehouse, Harper John; and Horwath, Tibor G., to United States of America, Navy. Apparatus and method for mapping acoustic fields. 3,961,291, Cl. 333-31.00R.

Whiting Corporation: *See—*
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Whitworth, Edward; Gordon, Stuart; and Hayes, Stephen Harry, to Imperial Chemical Industries Limited. Propellents. 3,960,621, Cl. 149-65.000.

Wiater, Kenneth Walter, to Teletype Corporation. Skirted dashpot piston. 3,960,250, Cl. 188-281.000.

Wick, Karl, to Fritz Buser AG Maschinenfabrik. Rotary screen printing machine with angle and pressure adjustable squeegee. 3,960,076, Cl. 101-119.000.

Widmer, Erich; and Seuret, Marcel, to Hoffmann-La Roche Inc. Ketoisophorone manufacture. 3,960,966, Cl. 260-586.00P.

Wiechert, Rudolf: *See—*
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Wiedamann, Karl Edward, to Procter & Gamble Company, The. Tape tab cutter and applicator. 3,960,646, Cl. 156-518.000.

Wiedermann, Hans E.: *See—*
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Wiegand, Karl E., to Ethyl Corporation. 3-Hydroxy-3,4-dicarbamoylbutyric acid and salts. 3,960,941, Cl. 260-534.00E.

Wiewiorowski, Tadeusz K.; and Miller, David J., to Freeport Minerals Company. Production of alumina from ores. 3,961,030, Cl. 423-126.000.

Wiggenhorn, James T., to Motorola, Inc. Slotted strip-line. 3,961,296, Cl. 333-84.00M.

Wilbur, Raymond Francis. Strain reliever for electric plug-socket connection. 3,960,432, Cl. 339-103.00R.

Wilding, Frank, to Imperial Chemical Industries Limited. Method of forming a bulked polyester textile yarns. 3,959,962, Cl. 57-157.00F.

Wilken, Leon Otto, Jr.: *See—*
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Wilkes, Donald F., to Hosmer/Dorrance Corporation. Motion damper. 3,960,247, Cl. 188-1.00B.

Wilkinson Sword Limited: *See—*
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1 3,960,573
3 3,960,574
10 3,960,575
14 3,960,576
44 3,960,577
47Q 3,960,578
52 3,960,579
58 3,960,580
65 3,960,581
90 3,960,582
122 3,960,583
178 3,960,584
274 3,960,585
288B 3,960,586
288Q 3,960,587
3,960,588
296 3,960,589
302 3,960,590
308M 3,960,591
308Q 3,960,592

CLASS 108
41 3,960,092

CLASS 110
3.5 3,960,093

CLASS 112
110 3,960,094
118 3,960,095
121.11 3,960,096
214 3,960,097
228 3,960,089
252 3,960,098

CLASS 113
7R 3,960,099

CLASS 114
61 3,960,100
73 3,960,101
120 3,960,102

CLASS 115
1C 3,960,103

CLASS 116
22R 3,960,105
60 3,960,104
67R 3,960,106
118A 3,960,107

CLASS 118
324 3,960,108
637 3,960,109

CLASS 119
23 3,960,111
28 Re.28,834
3,960,110
51R 3,960,112
99 3,960,113
157 3,960,114

CLASS 123
8.09 3,960,115
8.45 3,960,116
8.49 3,960,117
32EA 3,960,118
3,960,120
32C 3,960,119
34A 3,960,121
97B 3,960,122
103R 3,960,123
117A 3,960,124
3,960,125
120 3,960,126
140MP 3,960,127
148CC 3,960,129
148E 3,960,128
179A 3,960,130
187.5R 3,960,131
196CP 3,960,132
198R 3,960,133

CLASS 126

24 3,960,134
270 3,960,135
271 3,960,136
387 3,960,137

CLASS 128

2F 3,960,139
2H 3,960,138
2.06E 3,960,141
2.06R 3,960,140
2.08 3,960,142
4 3,960,143
58 3,960,144
68.1 3,960,145
75 3,960,146
92B 3,960,147
188 3,960,148
214R 3,960,149
260 3,960,150
334R 3,960,151
335.5 3,960,152
347 3,960,153

CLASS 132

9 3,960,154
3,960,155
31R 3,960,156
40 3,960,157
56 3,960,158
90 3,960,159
112 3,960,160

CLASS 134

37 3,960,593

CLASS 135

1R 3,960,161
35V 3,960,162

CLASS 136

6FS 3,960,596
3,960,597
6LN 3,960,594
3,960,595
86R 3,960,598
111 3,960,599
120FC 3,960,601
120R 3,960,600
134R 3,960,602
135R 3,960,603
233 3,960,604

CLASS 137

56 3,960,163
202 3,960,164
3,960,165
271 3,960,166
375 3,960,167
385 3,960,168
491 3,960,169
3,960,170
495 3,960,171
504 3,960,172
550 3,960,173
563 3,960,174
604 3,960,175
615 3,960,176
625.31 3,960,177

CLASS 138

30 3,960,178
3,960,179
110 3,960,180
178 3,960,181

CLASS 139

91 3,960,182
159 3,960,184
307 3,960,185
447 3,960,183
450 3,960,186

CLASS 141

1R 3,960,187

CLASS 142

7 3,960,188

CLASS 144

3D 3,960,189
3,960,190
32R 3,960,191

CLASS 148

1.5 3,960,605
2 3,960,606
3,960,607
6.14R 3,960,610
6.15R 3,960,611
6.3 3,960,609
12F 3,960,612
23 3,960,613
3,960,614
36 3,960,615
111 3,960,616
121 3,960,617
171 3,960,618
175 3,960,619
3,960,620

CLASS 149

65 3,960,621

CLASS 150

1 3,960,192
52R 3,960,193

CLASS 152

355 3,960,194

CLASS 156

3 3,960,622
16 3,960,623
69 3,960,624
79 3,960,625
93 3,960,626
104 3,960,627
123 3,960,628
180 3,960,629
190 3,960,630
222 3,960,639
244 3,960,631
245 3,960,632
247 3,960,633
277 3,960,634
286 3,960,635
290 3,960,636
293R 3,960,637
305 3,960,638
351 3,960,640
362 3,960,641
384 3,960,642
390 3,960,643
3,960,644
441 3,960,645
518 3,960,646
603 3,960,647

CLASS 160

105 3,960,195
222 3,960,196
371 3,960,197

CLASS 162

29 3,960,648
72 3,960,649
103 3,960,650
105 3,960,651
108 3,960,652
264 3,960,653
342 3,960,654

CLASS 164

7 3,960,198
281 3,960,200
312 3,960,201
325 3,960,202
339 3,960,199

CLASS 165

1 3,960,203
3,960,208
4 3,960,204
8 3,960,209
48 3,960,205
61 3,960,206
104R 3,960,207
149 3,960,210

CLASS 166

187 3,960,211
250 3,960,212
272 3,960,213
3,960,214
315 3,960,215

CLASS 169

48 3,960,216
64 3,960,217

CLASS 172

13 3,960,218
39 3,960,219
261 3,960,220
311 3,960,221

CLASS 174

22R 3,961,127
23C 3,961,128
72B 3,961,129
78 Re.28,837

CLASS 175

263 3,960,222
385 3,960,223

CLASS 176

18 3,960,655
58PB 3,960,656

CLASS 177

47 3,960,224
121 3,960,225
164 3,960,226
210 3,960,227
211 3,960,228

CLASS 178

2E 3,961,130
6.6R 3,961,131
6.7R 3,961,132
6.8 3,961,133
7.3D 3,961,134
7.3R 3,961,135
67 3,961,136
68 3,961,137
69.5R 3,961,138

CLASS 179

15AL 3,961,139
15AT 3,961,140
16EC 3,961,141
81R 3,961,142
84VF 3,961,143
99 3,961,144

CLASS 180

1VS 3,960,229
9.62 3,960,230
19R 3,960,231
64A 3,960,232
77R 3,960,233
82A 3,960,235
132 3,960,234

CLASS 181

33G 3,960,236
33K 3,960,237
3,960,238
49 3,960,239

CLASS 182

20 3,960,240
33.3 3,960,241
36 3,960,242

CLASS 184

6 3,960,243
6.14 3,960,244
6.16 3,960,245

CLASS 185

40H 3,960,246

CLASS 188

1B 3,960,247
181R 3,960,248
264F 3,960,249
281 3,960,250
286 3,960,251

CLASS 190

18A 3,960,252

CLASS 192

67A 3,960,253

CLASS 194

9T 3,960,254

CLASS 195

1.8 3,960,657
5 3,960,659
28N 3,960,660
3,960,661
29 3,960,662
31F 3,960,663
59 3,960,664
66R 3,960,665
68 3,960,666
80R 3,960,667
103.5R 3,960,658
3,960,669
3,960,670

CLASS 197

1R 3,960,255
3,960,256
6.7 3,960,257
127R 3,960,258
151 3,960,259

CLASS 198

19 3,960,260
26 3,960,261
127R 3,960,262
170 3,960,263
179 3,960,264
204 3,960,265
235 3,960,266
278 3,960,267

CLASS 200

155A 3,961,145
157 3,961,146
159B 3,961,147
268 3,961,148

CLASS 202

185R 3,960,668

CLASS 203

7 3,960,671
37 3,960,672

CLASS 204

1R 3,960,673
16 3,960,674
25 3,960,675
38A 3,960,676
55R 3,960,677
67 3,960,678
73A 3,960,679
98 3,960,680
114 3,960,681
157.1H 3,960,682
158R 3,960,683
159.11 3,960,684
159.12 3,960,685
159.19 3,960,686
164 3,960,687
181 3,960,688
195F 3,960,689
195R 3,960,690
3,960,691
195S 3,960,692
3,960,693
219 3,960,694
227 3,960,695
245 3,960,696
252 3,960,697
267 3,960,698
268 3,960,699

CLASS 206

45.33 3,960,268
233 3,960,269
256 3,960,270
315R 3,960,271
389 3,960,272
534 3,960,713

CLASS 208

8 3,960,700
3,960,701
11R 3,960,702
26 3,960,703
50 3,960,704
111 3,960,705
112 3,960,706
113 3,960,707
121 3,960,708
139 3,960,709
3,960,710
3,960,711
216 3,960,712

CLASS 209

139A 3,960,714
166 3,960,715
220 3,960,716

CLASS 210

6 3,960,717
14 3,960,718
23R 3,960,719
25 3,960,721
36 3,960,722
42S 3,960,723
49 3,960,724
67 3,960,725
77 3,960,726
78 3,960,727
167 3,960,728
232 3,960,729
321A 3,960,730
332 3,960,731
386 3,960,732
460 3,960,733
512M 3,960,734

CLASS 211

1.3 3,960,274
4 3,960,273
182 3,960,275

CLASS 214

1BH 3,960,277
1BT 3,960,276
1BV 3,960,279
8.5A 3,960,280
10.5D 3,960,281
16.1CB 3,960,282
17CB 3,960,283
138R 3,960,284
141 3,960,285
674 3,960,286

CLASS 215

253 3,960,287
329 3,960,288

CLASS 219

9.5 3,961,149
10.49 3,961,150
3,961,151
10.55B 3,961,152
56 3,961,153
135 3,961,154
216 3,961,155
331 3,961,156
345 3,961,157
471 3,961,158

CLASS 220

318 3,960,289
338 3,960,290

CLASS 221

36 3,960,291
211 3,960,292
258 3,960,293

CLASS 222

103 3,960,294
145 3,960,295
146HE 3,960,296
449 3,960,297
541 3,960,298
559 3,960,299

CLASS 224

8R 3,960,300
42.1R 3,960,301
45S 3,960,302

CLASS 226

1 3,960,303
74 3,960,304
95 3,960,305
96 3,960,306

CLASS 227

144 3,960,307

CLASS 228

5.1 3,960,308
3,960,309
6R 3,960,310
49 3,960,311

CLASS 229

37R 3,960,312
41B 3,960,313
62 3,960,314
87F 3,960,315

CLASS 232

1C 3,960,316
35 3,960,317

CLASS 233

4 3,960,318
19R 3,960,319

CLASS 235

1D 3,961,159
61.11A 3,961,163
61.11E 3,961,160
3,961,162
61.11F 3,961,161
61.12N 3,961,164
92SH 3,961,165
150.27 3,961,166
152 3,961,167
3,961,168
3,961,169
154 3,961,170
181 3,961,171
3,961,172
184 3,961,173

CLASS 236

15B 3,960,320
100 3,960,321

CLASS 239

3 3,960,323
4 3,960,324
13 3,960,325
214 3,960,326
236 3,960,327
264 3,960,328

CLASS 240

8.18 3,961,174
10.63 3,961,175
81BC 3,961,176

CLASS 241

23 3,960,329
30 3,960,330
43 3,960,331
46.06 3,960,332
46.15 3,960,333
60 3,960,334
236 3,960,335

CLASS 242

18PW 3,960,336
68.3 3,960,337
74.1 3,960,338
107.4R 3,960,339
117 3,960,340
118.1 3,960,341
192 3,960,342

CLASS 244

1R 3,960,343
83D 3,960,348
130 3,960,345
155A 3,960,346
155R 3,960,347
182 3,960,344

CLASS 248

27R 3,960,349
54R 3,960,350
101 3,960,351
188 3,960,352
309R 3,960,353
345.1 3,960,354

CLASS 249

189 3,960,355
205 3,960,356
211 3,960,357

CLASS 250

201 3,961,177
3,961,178
203R 3,961,179
206 3,961,180
208 3,961,181
213VT 3,961,182
214R 3,961,183
231R 3,961,184
3,961,185
272 3,961,186
301 3,961,187
303 3,961,188
304 3,961,189
310 3,961,190
312 3,961,191
315R 3,961,192
324 3,961,193
334 3,961,194
385 3,961,195
3,961,196
493 3,961,197
566 3,961,198

CLASS 251

61.5 3,960,358
141 3,960,361
174 3,960,363
210 3,960,364
286 3,960,365
341 3,960,366

CLASS 252

2 3,960,735
8.55R 3,960,736
62.1L 3,960,737
62.1P 3,960,738
63.2 3,960,739
73 3,960,740
79.3 3,960,741
90 3,960,742
99 3,960,743
102 3,960,744
106 3,960,745
171 3,960,746
182 3,960,747
299 3,960,748
3,960,749
3,960,750
3,960,751
3,960,752
3,960,753
300 3,960,754
301.16 3,960,755
301.18 3,960,756
316 3,960,757
404 3,960,758
408 3,960,759
412 3,960,760
421 3,960,761
426 3,960,762
428 3,960,763
429B 3,960,765
429R 3,960,764
437 3,960,766
3,960,767
444 3,960,768
3,960,769
3,960,770
446 3,960,771
455R 3,960,772
3,960,773
455Z 3,960,774
463 3,960,775
465 3,960,776
3,960,975
514 3,960,777
519 3,960,778
521 3,960,779
532 3,960,780
541 3,960,781
544 3,960,782

CLASS 254

67 3,960,359
139.1 3,960,360
168 3,960,362

CLASS 256

21 3,960,367

CLASS 259

10 3,960,368
111 3,960,369
118 3,960,370

CLASS 260

2R 3,960,783
2.5AW 3,960,788
2.5B 3,960,784
3,960,787
2.5E 3,960,792
2.5R 3,960,785
2.5S 3,960,786
17.3 3,960,794
21 3,960,789
23AR 3,960,791
23XA 3,960,790
28.5AS 3,960,793
29.2EP 3,960,795
29.3 3,960,796
29.6BM 3,960,798
29.6F 3,960,797
30.2 3,960,799
32.8SB 3,960,800
33.6EP 3,960,801
37EP 3,960,803
37SB 3,960,802
3,960,804
37N 3,960,805
40P 3,960,806
40R 3,960,807
42.1R 3,960,808
45.75N 3,960,809
46.5UA 3,960,810
47EP 3,960,813
47ET 3,960,811
47UA 3,960,812
47R 3,960,814
49 3,960,815
73L 3,960,816
75M 3,960,817

77.5C 3,960,818
78R 3,960,819
3,960,820
79.3A 3,960,821
79.5P 3,960,822
112R 3,960,827
112.5R 3,960,720
3,960,828
3,960,829
3,960,830
186 3,960,831
209R 3,960,832
210AB 3,960,833
3,960,834
3,960,836
3,960,837
3,960,838
210R 3,960,835
210.5 3,960,839
211.5R 3,960,840
239.1 3,960,843
3,960,844
3,960,845
239.3A 3,960,846
239.55C 3,960,842
239.55R 3,960,841
240F 3,960,848
240K 3,960,847
243C 3,960,849
3,960,850
3,960,851
3,960,852
3,960,853
3,960,855
243D 3,960,854
243R 3,960,856
246B 3,960,857
247.2B 3,960,858
247.5FP 3,960,859
251A 3,960,860
256.4F 3,960,863
256.4Q 3,960,861
256.5R 3,960,862
260 3,960,864
268PL 3,960,865
278 3,960,866
281P 3,960,867
287AN 3,960,868
290HL 3,960,869
293.5 3,960,870
293.57 3,960,871
293.62 3,960,872
293.73 3,960,873
293.82 3,960,874
293.89 3,960,875
294.8C 3,960,876
295.5A 3,960,877
296AE 3,960,878
297B 3,960,879
3,960,880
306.7C 3,960,881
309.5 3,960,883
309.7 3,960,884
326.5FM 3,960,887
326.5A 3,960,885
3,960,888
326.5E 3,960,889
326.5L 3,960,886
326.85 3,960,890
327TH 3,960,891
3,960,892
332.2A 3,960,893
332.3P 3,960,894
340.5 3,960,895
3,960,896
343 3,960,897
343.2F 3,960,898
346.2M 3,960,899
346.8R 3,960,900
3,960,901
348R 3,960,902
369 3,960,903
397.2 3,960,904
403 3,960,905
410.9R 3,960,906
3,960,907
414 3,960,908
429J 3,960,909
438.1 3,960,910
439CY 3,960,911
448A 3,960,912
448.8R 3,960,913
453PH 3,960,916
453P 3,960,914
3,960,915
453R 3,960,943
455A 3,960,917
456A 3,960,918
3,960,919
464 3,960,920
3,960,921
465D 3,960,922
465.3 Re.28,836
3,960,925
465.9 3,960,923
3,960,924
470 3,960,926
471A 3,960,927
473S 3,960,928
3,960,929
475N 3,960,930
479R 3,960,931
3,960,932
482P 3,960,933
484R 3,960,934
485G 3,960,935
488CD 3,960,936
501.2 3,960,937
504S 3,960,938
526N 3,960,939
534E 3,960,941
534R 3,960,942
534S 3,960,940
558R 3,960,944
559R 3,960,945
561H 3,960,946
561R 3,960,947
562B 3,960,948
564B 3,960,949
566AC 3,960,951
566AE 3,960,956
566A 3,960,953
3,960,954
3,960,955
566R 3,960,950
3,960,952
566 3,960,957
570R 3,960,960
570.5CA 3,960,961
570.5P 3,960,959
570.9 3,960,958
581 3,960,962
582 3,960,963
583M 3,960,964
584R 3,960,965
586P 3,960,966
607R 3,960,967
619R 3,960,968
627H 3,960,969
631H 3,960,970
638R 3,960,971
3,960,972
3,960,973
649R 3,960,974
674R 3,960,976
677R 3,960,977
683.15R 3,960,978
834 3,960,979
835 3,960,980
837R 3,960,981
838 3,960,982
839 3,960,983
857F 3,960,984
874 3,960,985
876R 3,960,986
878B 3,960,987
879 3,960,988
884 3,960,989

CLASS 261

39A 3,960,990
92 3,960,991
152 3,960,992

CLASS 264

.5 3,960,994
3B 3,960,993
27 3,960,995
37 3,960,996
40 3,960,997
45.1 3,960,998
45.3 3,960,999
45.5 3,961,000
46.4 3,961,001
46.5 3,961,002
81 3,961,003
115 3,961,004
117 3,961,005
138 3,961,006
140 3,961,007
178R 3,961,008
205 3,961,009
221 3,961,010
251 3,961,011
257 3,961,012
297 3,961,013
3,961,014

CLASS 269

55 3,960,371
320 3,960,372

CLASS 271

10 3,960,373
189 3,960,374

CLASS 272

3 3,960,375

CLASS 273

1E 3,960,376
1R 3,960,377
85H 3,960,378
95R 3,960,379
101.1 3,960,380

CLASS 277

1 3,960,381

CLASS 280

11.37P 3,960,382
12.14 3,960,387
203 3,960,391
282 3,960,392
612 3,960,383
623 3,960,384
692 3,960,385
693 3,960,388
697 3,960,389
731 3,960,386
3,960,390

CLASS 285

137R 3,960,393
297 3,960,394
370 3,960,395

CLASS 290

52 3,961,199

CLASS 292

347 3,960,396

CLASS 293

86 3,960,397

CLASS 294

16 3,960,398
86.25 3,960,399

CLASS 295

11 3,960,400

CLASS 296

1A 3,960,401
1S 3,960,402
137B 3,960,403
137F 3,960,404

CLASS 297

248 3,960,405
345 3,960,406

CLASS 299

17 3,960,407
19 3,960,408

CLASS 301

5B 3,960,409

CLASS 303

21A 3,960,410
23R 3,960,411

CLASS 305

57 3,960,412

CLASS 307

112 3,961,200
116 3,961,201
150 3,961,202
236 3,961,203
252N 3,961,204
261 3,961,205
3,961,206
273 3,961,207
297 3,961,208

CLASS 308

3A 3,960,413
9 3,960,414
36.1 3,960,415
72 3,960,416
170 3,960,417
184R 3,960,418
216 3,960,419

CLASS 310

6 3,961,209
9.5 3,961,210
68C 3,961,211
68R 3,961,212
104 3,961,213
155 3,961,214
168 3,961,215

CLASS 312

29 Re.28,835
140.1 3,960,420

CLASS 313

51 3,961,216
188 3,961,217
220 3,961,218
389 3,961,219
417 3,961,220
481 3,961,221

CLASS 315

49 3,961,222
371 3,961,223

CLASS 316

17 3,960,421
19 3,960,422

CLASS 317

18R 3,961,224
61 3,961,225
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116R 3,961,284

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CLASS 404

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	3,961,088	644	3,961,096		3,961,101	390	3,961,110	90	3,961,116	250	3,961,124
274	3,961,089	658	3,961,081		3,961,102	419	3,961,111	96	3,961,117	261	3,961,125
281	3,961,090		CLASS 427	198	3,961,104			151	3,961,118		CLASS 526
307	3,961,091	2	3,961,097	220	3,961,105		CLASS 428	178	3,961,119	85	3,960,824
331	3,961,092	34	3,961,098	221	3,961,106	29	3,961,112	200	3,961,121	103	3,960,826
535	3,961,093	39	3,961,103	246	3,961,107	35	3,961,113	210	3,961,120	206	3,960,825
536	3,961,094	43	3,961,099	275	3,961,108	38	3,961,114	220	3,961,122	237	3,960,823

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	233 240,092		240,106		47 240,119		15 240,130		38 240,142	D40—	E 240,155
	240,093	D 8—	14 240,107		106 240,120		40 240,131		240,143	D48—	16B 240,157
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D6—	24 240,098		90 240,110		123 240,123	D24—	1B 240,134	D34—	4R 240,146	D56—	4B 240,159
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3,960,054	3,960,117	3,960,512	3,961,336	3,960,778	3,959,940
3,960,140	3,960,128	3,960,515	3,961,350	3,960,932	3,959,949
3,960,694	3,960,142	3,960,552	8 : 3,959,834	3,960,956	3,959,983
3,961,097	3,960,145	3,960,589	3,960,113	3,960,979	3,960,006
3,961,146	3,960,146	3,960,613	3,960,139	3,960,984	3,960,042
3,961,272	3,960,155	3,960,614	3,960,349	3,961,112	3,960,043
4 : 3,959,844	3,960,156	3,960,632	3,960,456	3,961,164	3,960,048
3,959,968	3,960,159	3,960,643	3,960,472	11 : 3,960,133	3,960,059
3,960,131	3,960,179	3,960,644	3,960,702	3,960,695	3,960,061
3,960,268	3,960,181	3,960,734	3,961,077	12 : 3,959,837	3,960,075
3,960,330	3,960,196	3,960,747	3,961,140	3,959,849	3,960,094
3,960,527	3,960,206	3,960,832	3,961,369	3,959,855	3,960,095
3,960,550	3,960,211	3,960,907	3,961,370	3,959,881	3,960,149
3,960,735	3,960,212	3,960,917	3,961,372	3,959,905	3,960,172
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5 : 3,959,912	3,960,218	3,960,936	3,959,916	3,959,980	3,960,174
3,960,281	3,960,236	3,960,943	3,959,947	3,960,111	3,960,191
3,960,362	3,960,246	3,960,951	3,959,997	3,960,171	3,960,238
3,961,318	3,960,269	3,960,957	3,960,144	3,960,224	3,960,242
6 : 3,959,826	3,960,271	3,960,995	3,960,152	3,960,231	3,960,250
3,959,831	3,960,272	3,961,007	3,960,208	3,960,244	3,960,270
3,959,846	3,960,277	3,961,015	3,960,227	3,960,353	3,960,286
3,959,871	3,960,282	3,961,059	3,960,348	3,960,430	3,960,305
3,959,880	3,960,293	3,961,081	3,960,416	3,960,539	3,960,313
3,959,883	3,960,294	3,961,091	3,960,419	3,960,626	3,960,347
3,959,885	3,960,297	3,961,099	3,960,425	3,960,650	3,960,354
3,959,886	3,960,302	3,961,130	3,960,442	3,960,679	3,960,365
3,959,918	3,960,317	3,961,139	3,960,502	3,961,228	3,960,373
3,959,922	3,960,319	3,961,153	3,960,542	3,961,249	3,960,391
3,959,937	3,960,325	3,961,163	3,960,657	3,961,288	3,960,397
3,959,948	3,960,331	3,961,172	3,960,658	3,961,296	3,960,406
3,959,975	3,960,338	3,961,179	3,960,739	13 : 3,960,240	3,960,412
3,959,987	3,960,342	3,961,180	3,960,754	3,960,563	3,960,415
3,959,989	3,960,343	3,961,182	3,960,785	3,960,606	3,960,435
3,959,995	3,960,356	3,961,197	3,960,869	3,960,756	3,960,447
3,960,002	3,960,361	3,961,198	3,960,901	3,960,897	3,960,454
3,960,004	3,960,363	3,961,214	3,960,913	3,961,002	3,960,469
3,960,013	3,960,402	3,961,224	3,960,963	15 : 3,961,292	3,960,499
3,960,014	3,960,422	3,961,237	3,960,983	3,961,330	3,960,546
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3,960,036	3,960,429	3,961,279	3,961,065	3,959,839	3,960,709
3,960,047	3,960,432	3,961,282	3,961,067	3,959,854	3,960,710
3,960,052	3,960,437	3,961,283	3,961,132	3,959,868	3,960,711
3,960,070	3,960,440	3,961,284	3,961,157	3,959,893	3,960,712
3,960,074	3,960,448	3,961,286	3,961,231	3,959,896	3,960,721
3,960,080	3,960,449	3,961,291	3,961,239	3,959,899	3,960,733
3,960,091	3,960,452	3,961,305	3,961,304	3,959,901	3,960,742
3,960,093	3,960,465	3,961,316	3,961,329	3,959,903	3,960,774
3,960,099	3,960,466	3,961,325	10 : 3,960,528	3,959,907	3,960,816
3,960,104	3,960,497	3,961,334	3,960,746	3,959,915	3,960,865

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DESIGN PATENTS

4 : 240,109
6 : 240,094
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8 : 240,158
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39 : 240,095

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46 : 240,141
48 : 240,149

PLANT PATENTS

9 : 3,897

3,898

12 : 3,899

39 : 3,896

42 : 3,900

DEFENSIVE PUBLICATIONS APPLICATIONS

[Notice of Dec. 16, 1969, 869 O.G. 6877]

8 : T947,012
10 : T947,001

18 : T947,007
34 : T947,004

36 : T947,005
40 : T947,003

T947,006
42 : T947,008

47 : T947,002
T947,009

T947,010

U.S. DEPARTMENT OF COMMERCE

Elliot L. Richardson, Secretary

PATENT AND TRADEMARK OFFICE

C. Marshall Dann, Commissioner